



An ATARI™ Users Magazine

75p

UTILITIES REVIEWED

ISSUE 5

INSIDE...

- TARGET
- SQUARES
- COLOUR SELECTOR
- VERTICAL PLAYER MOVEMENT
- MEMORY MAPPED SCREENS 2
- SOFTWARE REVIEWS.... and More!





An ATARI™ Users Magazine

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SEE PAGE 25 FOR NEW LISTING CONVENTIONS.



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PAGE 6 is a Users magazine and relies entirely on readers' support in submitting articles and programs. The aim is to explore Atari computing through the exchange of information and knowledge and we cannot, unfortunately, pay for articles published. We hope you will gain satisfaction from seeing your work published and in turn we hope you will learn from articles submitted by other readers.

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EDITORIAL

What do Atari users do in the summer? No, it isn't a conundrum, merely a comment, that judging by the almost empty postbag, the one thing you do not do is compute. Still we have had some fine days and maybe when the summer is over—all too soon—you will start writing in again. PAGE 6 goes on come rain or shine and this issue brings you some more good programs and articles. A couple of items deserve special mention and the first is Mark Hutchinson's article on your chance of fame, if not fortune. Do read it, it sums up nicely what PAGE 6 is trying to achieve. Look out for a couple of articles from Mark in coming issues. Next take a look at the second part of Phil Griffin's article on Memory Mapped Screens and in particular the demo program. It is a bit long for a demo but if you type it in, you will find the basis for what could be a very fine game. How about one of you adding some Players and Missiles and letting us have a new game for a future issue.

What gets you excited about Atari computing? As far as I am concerned, getting new programs in the Public Domain from America and elsewhere is one of the most enjoyable things which has come from starting PAGE 6. They may not be as good as commercial programs, but they bring new programming ideas and what's more they are free (well almost). Evidently you, the readers, do not share the same enthusiasm for not one person has, as yet, responded to the plea in the last issue for some programs to exchange. So what does get you excited Atari-wise?

Last issue I mentioned that we would be publishing a definitive list of Atari related books but you will not find it here. I did not realise just how many books there are—the list is now over 50. That would take up too much valuable space in the magazine but if any reader would like a copy of the list, please send 50p to cover the photocopying costs and a large stamped addressed envelope. A list of over 50 Atari books will then be yours.

BACK ISSUES

Issue 1 sold out.

Issues 2 & 3 70p. each inc. p. & p.

Issue 4 £1.00 inc. p. & p.

Deduct 15p for any two copies or 25p for three.

NEWS and VIEWS

First the BAD news. Remember those super new machines mentioned in the last issue? Well, according to one of the trade papers, Atari (UK) have no plans to introduce the 1400XL or the 1200XL in the U.K. That's not too bad but the real stunner is that when they introduce the 1450XLD they are going to strip out the modem and voice synthesiser. Apparently they say there are compatability problems with the modem (comments please from Atari owning GPO technicians) and voice synthesis is not something that the British market wants! Atari thereby deal themselves another body blow as far as the British market is concerned. Communication between computers is going to be a big thing in the next couple of years and another manufacturer is going to introduce a machine with voice synthesis. In fact I believe that the BBC already has the facility although I don't know if the chip is currently available. New buyers are impressed by technology which hits them in the eye and what could be more impressive than a machine telling you of it's own features? What happens when all the software using voice synthesis starts appearing in the States? Atari surely cannot realise the amount of Third Party software that is bought by U.K. owners. Think again, Atari.

Recent software which is NOW available in the U.K. includes **BLUE MAX** (32K)—a WW1 flying game with 3-D graphics like Zaxxon, and **SHADOW WORLD** (32K) both from Synapse. From Datasoft, **O'RILEY'S MINE** (16K)—a Dig-Dug type game. A new one from Infocom—**WITNESS** (48K) which is a follow-up to Deadline. This one is a whodunnit based around the classic murder mystery novels of the 1930's. **Pm ANIMATOR** from Don't Ask—reputed to be the finest player-missile utility yet. From Santa Cruz, **TRICKY TUTORIALS 8/9/10** (all 16K) on Character Graphics, GTIA and Sound Effects.

Coming soon . . . Word Wizard, Script Wizard and Money Wizard, all on ROM from Datasoft and six new titles from First Star Software who brought you the excellent Astro Chase. These are **BRISTLES, RENT WARS, FLIP-FLOP, TOP SECRET, SAVIOUR 1** and **DANGEROUS CARGO**. At the time of writing, none of these products were available, even in the States, so be patient. •

User Groups/Contact

There is a new Atari User Group in Nottingham, or rather an Atari sub-group of the Nottingham Micro-Computer Club. Meetings are held fortnightly on Mondays at 7.30 p.m. at THE OLD CHURCH, CASTLEGATE, NOTTINGHAM. If you would like more details contact Dane Carty on 021-378 2235.

Merseyside Atari Computer Club now meet at the Holiday Inn in Liverpool still on every other Tuesday. Phone Roy Gibson on 051-606 9553 for further details.

ALEXANDER KELLS of 50 MONTGOMERY HOUSE, CLAREMONT ROAD, SEAFORTH, LIVERPOOL L21 1AU, would like to correspond with anyone interested in Adventures and would like some advice on how to program one. Write to him if you can help or want to share ideas.

Someone phoned a while back to ask how to get out of the Black Room or Stone Cell in Escape from Traam, but I have mislaid his name and phone number. If you are still in there please phone again and if any readers know the answer, please write in.

ATTENTION USER GROUP SECRETARIES. Why not write an account of what goes on in your group so that others will have an idea of what they can do in setting up a group of their own? It does not matter how large or small you are, other users will be interested in what you do. •

★★★From U.S.A.★★★

We are pleased to be able to feature in this issue a column written specially for PAGE 6 by Michael Lechkun of Michigan Atari Computer Enthusiasts, one of the biggest User Groups in the U.S.A. Hopefully, this will become a regular column bringing us news and views from 'Across the Pond'.

I will be sending back a column to M.A.C.E. and if any readers have any news or views which they feel would be of interest to fellow Atari Users in the U.S., please let me know.

Turn to page 14.

INPUT

Dear Les,

May I ask you to correct an error in the Basic Timing listing in my article in Issue 4? Line 1000 should read 1000 X=0:M1=1234. The actual number that M1 equals does not matter since on the first run, when X=0, a new line 1000 is put up on the screen which when entered makes M1 equal to the FRE(0) at the time of the first run. This takes care of different memory sizes, DOS usage, etc., and makes lines 1-7 unnecessary.

May I also suggest a small improvement. Add 1025 ? CHR$(125):IF X=0 THEN 1050 which gets rid of the 'Loop now running' before printing the results and cuts out irrelevancies on the first run.

David Harry,
Solihull

***I changed line 1000 for testing purposes and forgot to change it back! I am also responsible for adding lines 1-7. Sorry!—Ed.*

□ □ □ □ □ □ □ □ □

Dear Les,

Firstly, let me congratulate you on an excellent Atari only magazine.

With regard to Tony Amesbury's letter concerning 'lock-up', my experience has proved to me that lock-up only occurs whilst typing in a program and then only after extensive editing particularly INSERTing or DELETEing lines. The solution seems obvious, be extremely careful when typing in new programs and use the CTRL INSERT/DELETE keys as little as possible.

Tony Amesbury said that after he POKEd location 832 with 6 a program that frequently disabled his machine was OK. Well, location 832 controls the IOCB and when the machine is turned on it is already set to 6. Any other number may crash the computer.

John Fallon,
Birmingham

Dear Les,

I read with great excitement, the letter from Tony Amesbury 'could POKE 832,6 be the answer to the famous Atari lock-up?'. No such luck!!

If you type PEEK(832) when you power up, the computer tells you that 6 is already there.

Why isn't the Revision B chip available in England? I believe this chip solves the problem.

Stephen Taylor,
London

***ATARI do admit to the lock-up problem but do not offer a solution. In an update to the BASIC Reference Manual they say " Note: Large amounts of editing may lock-up the system. It's recommended that programs under development be stored to cassette or diskette periodically (every 30 or 40 edits) with the SAVE or CSAVE command."*

□ □ □ □ □ □ □ □ □

Dear Sir,

I received the first three issues of PAGE 6 and found them to be of great value.

I think that the information needed by the majority of Atarians is the simple tutorial-type articles and hence I would like to suggest you dedicate more space to the Getting Started and First Steps sections. Your in-depth software reviews are excellent, congratulations and good luck.

Alan Chaloner,
Chester

***I try to make sure that the articles and programs in PAGE 6 can be understood by beginners but it is very difficult sometimes to strike a balance. Beginners soon become advanced users and then want more advanced articles. First Steps is the most difficult column to write in the magazine as it is now very hard to recall all those little things that gave me problems in the beginning. The best way to get an answer to a particular problem is to write to PAGE 6. Any questions received will be published, with answers, in the next First Steps column. You may have found the answer yourself by then but your question will help someone else. Stuck on something? It doesn't matter how simple it is, write to FIRST STEPS at PAGE 6.* ●

What's Wrong with Fame?

Mark Hutchinson, Belfast

A magazine survives because people like it enough to buy it. The magazine has to align itself with the needs or wishes of its readership. In respect of a computer magazine one of these wishes is free games, another is programming tips. Both are important, especially to beginners. Many magazines do however tend to get too professional, or too in-depth and so cause the amateur to feel left out or unwanted. The feeling is then 'My little listing is childish compared to that' and so another contributor is lost and the great sadness is that with a bit of encouragement and lots of tips on technique, that programmer could well be a future Chris Crawford or a new Scott Adams. New techniques do not always originate from the masters of the art, sometimes you get too tied down with the norm and it takes a question such as 'What if . . . ?', born out of innocence, to open others' eyes.

A professional programmer needs a long time to write and debug a new program and often does not have the time to experiment. He has to rely on people who have the time finding out odd titbits for him to use. Guess who has the time to fiddle about on the keyboard? Why us—you and me—the amateurs.

I will admit that in some respects I am still a child. I really miss those 5 or 6 line programs with flashing colours and zaps or bangs. Where have they all gone? I remember seeing them in ANALOG not so long ago. Will PAGE 6 and its readers help to save this endangered species?

I have included a small listing for this article, not with flashes and bangs, just a case of putting my bytes where my mouth is! I hope that this will stimulate the rest of you to write in. After all, it's a chance to see your name in print and what's wrong with fame anyway?

No apologies are made for the lack of neatness in flow, even though I should have known better. If you decide to try it out, don't write in to the Editor with " He should have done . . ." Send in your own program instead. I am sure the Editor will forgive you if the line numbers are not neatly spaced. The listing was condensed from another of my programs thus explaining the odd line numbers. That's my excuse and I am sticking to it!

```
1 REM ******************************
2 REM * HELLO DEMO - A LA BBC NEWS *
3 REM *            BY              *
4 REM *     MARK HUTCHINSON        *
5 REM ******************************
6 REM
10 DIM D$(18):GRAPHICS 18:P1=900:P2=95
0:P3=975:P4=980:N1=200:N2=100
20 FOR F=1 TO 5:POSITION 0,5:? #6;"*":
GOSUB P1:POSITION 0,5:? #6;" ":GOSUB P
2:NEXT F
100 FOR X=1 TO 18:RESTORE 1000:READ D$
:GOSUB 925:POSITION X,5:? #6;D$(X,X):N
EXT X
200 FOR D=1 TO 100:NEXT D
800 FOR V=15 TO 0 STEP -0.25:SOUND 0,4
2,10,V:NEXT V:FOR D=1 TO 10:NEXT D
820 FOR V=15 TO 0 STEP -0.15:SOUND 0,6
4,10,V:NEXT V
830 GRAPHICS 18:GOTO 20
900 SOUND 0,N1,10,6:FOR T=1 TO 25:NEXT
 T:SOUND 0,0,0,0:RETURN
925 FOR F=1 TO 3:POSITION X,5:? #6;"*"
:GOSUB P3:POSITION X,5:? #6;" ":GOSUB
P4:NEXT F:RETURN
950 SOUND 0,N1,10,6:FOR T=1 TO 30:NEXT
 T:SOUND 0,0,0,0:RETURN
975 SOUND 0,N2,10,6:FOR T=1 TO 10:NEXT
 T:SOUND 0,0,0,0:RETURN
980 SOUND 0,N2,10,6:FOR T=1 TO 20:NEXT
 T:SOUND 0,0,0,0:RETURN
985 SOUND 0,N2,10,6:FOR T=1 TO 20:NEXT
 T:SOUND 0,0,0,0:RETURN
1000 DATA hello ATARI owners
```

Target

Ken Woodward, Abertillery, Gwent

You are represented in this game by a player on the right-hand side of the screen and the object is to obtain the best score possible by carefully aiming and firing each of your ten arrows at the target on the left. If you miss the board altogether you are given the opportunity to retrieve your arrow.

A hit in the outer ring records 200 points and the red ring scores 300. A bulls-eye is worth 500 but it is protected by a low-scoring green area worth only 100 points. Sounds easy, doesn't it? Oh, I forgot to mention that you are in constant motion and to make things even harder there are random speed changes at the extremes of your travel.

Press SELECT to choose one of the ten levels and START to begin to play. Press OPTION to review the highest score between games.

HOW IT WORKS

The main problem I encountered in writing this program was how to move Player Missiles up and down the screen at a reasonable speed in Basic. I found that it just could not be done and I have therefore used a machine language subroutine from an American magazine which moves Players during the Vertical Blank Interrupt. The code is poked into page six and is called only once with X=USR(1696). The subroutine then executes automatically every 50th of a second whilst the screen is off prior to being redrawn. Locations 1780-1783 become registers which hold the Y positions of each Player. If for example a 5 is POKEd into location 1780 then Player 1 will be moved to position X,5 instantly. Four players are supported but as you will see from the listing I have used only two (PLY and PLY+1). Horizontal movement is covered by using the normal X registers at 53248 and 53249 (PLX and PLX+1).

The program is well REMarked so you should have no trouble in following the code. Lines 19-21 create the custom screen by altering the display list. The main loop of the program is between lines 160 and 195. Note the use of the POP command which should be used whenever you jump out of a FOR . . . NEXT loop before the loop completes.

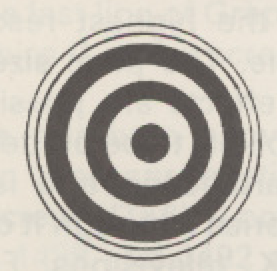
When writing programs I tend to use long variable names to make the listing easier to read. A couple of extra bytes are used when defining the variable but thereafter only one byte is used for any variable no matter what the length of the name.

I hope that you enjoy Target and that you learn a little from the listing. I have sent in my program, how about sending in one of yours? I like to type them in as well.

```
10 REM *********TARGET***************
11 REM *  BY K.WOODWARD MARCH 1983  *
12 REM *     TEL: (0495) 215222     *
13 REM ******************************
19 GRAPHICS 5:POKE 710,0:A=PEEK(560)+2
56*PEEK(561):POKE A+6,6
20 IF PEEK(A)<>66 THEN A=A+1:GOTO 20
21 POKE A,70:POKE A+3,6:POKE A+4,6:POK
E A+5,65:POKE A+6,PEEK(A+7):POKE A+7,P
EEK(A+8):REM CUSTOM SCREEN
22 POKE 87,1:POSITION 4,1:? #6;"PLEASE
 WAIT":FOR W=1 TO 500:NEXT W
70 POKE 559,0:REM SCREEN OFF
80 GOSUB 1000:REM DRAW TARGET
85 GOSUB 9000:REM V BLANK+PLAYERS
87 HIGH=0:WHERE=53253
90 REM
91 HITCLR=53278:SHOTS=10:LEVEL=0:SCORE
=0
100 POKE 87,1:POSITION 2,1:? #6;"selec
t level"
110 POKE 704,216:POKE 705,0:REM PLAYER
 COL
130 POKE PLH,33:POKE PLH+1,15:POKE 532
56,0:REM PLAYER HEIGHT
140 POKE PLX,194:POKE PLY,30:REM PLAYE
R 0 INITIAL POS
141 POKE PLX+1,194:POKE PLY+1,30:REM P
LAYER 1 INITIAL POS
142 IF LEVEL>9 THEN LEVEL=0
143 POKE 87,1:POSITION 17,1:? #6;LEVEL
144 FOR W=1 TO 250:NEXT W
145 KEY=PEEK(53279):POKE KEY,8
146 IF KEY=3 THEN 5101:REM SHOW HIGH S
CORE
147 IF KEY=6 THEN 151
```

▶

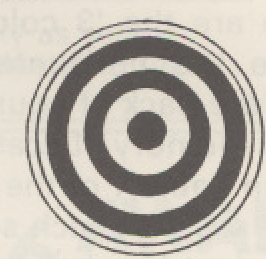
```
148 SOUND 0,50,10,2:FOR W=1 TO 20:NEXT
 W:SOUND 0,0,0,0
149 IF KEY=5 THEN LEVEL=LEVEL+1:SOUND
0,20,10,8:FOR W=1 TO 5:NEXT W:SOUND 0,
0,0,0:GOTO 142
150 GOTO 145
151 TOTAL=0
152 ? "level=";LEVEL;" score=";SCORE
153 ? "shots=";SHOTS;" total=";TOTAL
154 ? " "
160 REM MOVE BOTH PLAYERS UP/DOWN
161 REM
162 M=INT(2*RND(0))+LEVEL+1
163 POKE 77,0
165 FOR MOVE=31 TO 140 STEP M
167 POKE PLY,MOVE:POKE PLY+1,MOVE
170 IF STRIG(0)=0 THEN POP :GOTO 200
180 NEXT MOVE
182 M=INT(2*RND(0))+LEVEL+1
183 FOR MOVE=139 TO 30 STEP -M
184 IF STRIG(0)=0 THEN POP :GOTO 200
185 POKE PLY,MOVE:POKE PLY+1,MOVE
191 NEXT MOVE
195 GOTO 162
200 POKE 623,4:POKE 705,95:REM MISSILE
 FIRED
201 FOR MISSILE=195 TO 55 STEP -4:POKE
 PLX+1,MISSILE:POKE HITCLR,1:SOUND 0,4
,0,2:NEXT MISSILE:SOUND 0,0,0,0
202 FOR W=1 TO 3:SOUND 0,4,0,8:NEXT W:
SOUND 0,0,0,0:POKE 87,1:POSITION 2,1
203 IF PEEK(WHERE)=5 AND MOVE>56 AND M
OVE<98 THEN 2410:REM INNER RING
```



```
204 IF PEEK(WHERE)=7 THEN 2210:REM BUL
LS EYE
205 IF PEEK(WHERE)=4 OR PEEK(53253)=0
THEN 2010:REM OFF TARGET
210 IF PEEK(WHERE)=5 THEN 2110:REM OUT
ER RING
220 IF PEEK(WHERE)=6 THEN GOTO 2310:RE
M RED RING
300 ? :? :? :FOR W=1 TO 100:NEXT W
305 SHOTS=SHOTS-1:? "level=";LEVEL;" s
core=";SCORE
306 ? "shots=";SHOTS;" total=";TOTAL
307 ? " "
308 IF SHOTS<1 THEN GOTO 5000:REM END
OF THE PROGRAM
310 POKE 705,0:GOTO 160
400 REM SOUND FOR HITS
401 FOR S=120 TO 1 STEP -2:SOUND 0,S,1
0,10:NEXT S:SOUND 0,0,0,0
402 FOR S=1 TO 5:SOUND 0,Z,10,10:FOR W
=1 TO 50:NEXT W:SOUND 0,0,0,0:NEXT S:R
ETURN
1000 REM DRAW BOARD
1002 POKE 87,5
1005 POKE 708,164:COLOR 1:PLOT 5,5:DRA
WTO 5,23
1010 POKE 709,52:COLOR 2:PLOT 5,8:DRAW
TO 5,20
1020 PLOT 6,14
1025 COLOR 1:PLOT 5,11:DRAWTO 5,17
1030 POKE 710,8:COLOR 3:PLOT 3,2:DRAWT
O 3,26
1040 PLOT 4,4:DRAWTO 4,24
1050 PLOT 0,26:DRAWTO 3,26:DRAWTO 7,30
1060 COLOR 1:PLOT 0,30:DRAWTO 8,30:DRA
WTO 8,34:DRAWTO 79,34
1500 RETURN
```



```
2000 REM SCORES
2010 REM OFF TARGET
2020 ? #6;"mIsSeD tHe TaRgEt"
2025 FOR S=1 TO 120:SOUND 0,S,10,10:NE
XT S:SOUND 0,0,0,0
2030 SCORE=0
2045 FOR WALK=195 TO 58 STEP -1:POKE P
LX,WALK:NEXT WALK
2050 FOR W=1 TO 50:NEXT W
2055 FOR WALK=59 TO 195:POKE PLX,WALK:
POKE PLX+1,WALK:NEXT WALK
2099 GOTO 300
2110 REM OUTER RING
2120 ? #6;"OUTER RING HIT    "
2122 Z=60:GOSUB 400
2130 SCORE=200:TOTAL=TOTAL+SCORE
2199 GOTO 300
2210 REM BULLS EYE
2220 ? #6;"bulls eye hit    "
2222 FOR S=120 TO 1 STEP -2:SOUND 0,S,
10,10:NEXT S:SOUND 0,0,0,0
2223 FOR S=1 TO 120 STEP 2:SOUND 0,S,1
0,10:NEXT S:SOUND 0,0,0,0
2224 FOR S=120 TO 1 STEP -2:SOUND 0,S,
10,10:NEXT S:SOUND 0,0,0,0
2230 SCORE=500:TOTAL=TOTAL+SCORE
2299 GOTO 300
2310 REM RED RING
2320 ? #6;"red ring hit    "
2322 Z=10:GOSUB 400
2330 SCORE=300:TOTAL=TOTAL+SCORE
2399 GOTO 300
2410 REM GREEN MIDDLE
2420 ? #6;"GREEN RING HIT   "
2422 Z=40:GOSUB 400
2430 SCORE=100:TOTAL=TOTAL+SCORE
2499 GOTO 300
5000 FOR W=1 TO 250:NEXT W
5010 IF TOTAL>HIGH THEN HIGH=TOTAL
5101 POKE 87,1:POSITION 2,1:? #6;"high
 ";HIGH;" you ";TOTAL
5102 FOR W=1 TO 500:NEXT W
5103 POSITION 2,1:? #6;"
 "
5500 GOTO 90
9000 REM INITIALIZE VERTICAL BLANK
9010 FOR I=1536 TO 1706:READ A:POKE I,
A:NEXT I
9020 FOR I=1774 TO 1787:POKE I,0:NEXT
I
9025 REM SET PMBASE AND DRAW PLAYERS
9030 PM=PEEK(106)-16:PMBASE=256*PM
9040 FOR I=PMBASE+1023 TO PMBASE+2047:
POKE I,0:NEXT I
9050 FOR I=PMBASE+1025 TO PMBASE+1057:
READ A:POKE I,A:NEXT I
9060 FOR I=PMBASE+1291 TO PMBASE+1293:
READ A:POKE I,A:NEXT I
9080 PLX=53248:PLY=1780:PLH=1784
9090 POKE 559,62:POKE 623,1:POKE 1788,
PM+4:POKE 53277,3:POKE 54279,PM
9100 X=USR(1696)
9110 RETURN
```



```
10000 REM V/BLANK DATA
10010 DATA 162,3,189,244,6,240,89,56,2
21,240,6,240,83,141,254,6,106,141,255,
6,142,253,6,24,169,0,109,253,6
10020 DATA 24,109,252,6,133,204,133,20
6,189,240,6,133,203,173,254,6,133,205,
189,248,6,170,232,46,255,6,144
10030 DATA 16,168,177,203,145,205,169,
0,145,203,136,202,208,244,76,87,6,160,
0,177,203,145,205,169,0,145,203
10040 DATA 200,202,208,244,174,253,6,1
73,254,6,157,240,6,189,236,6,240,48,13
3,203,24,138,141,253,6,109,235
10050 DATA 6,133,204,24,173,253,6,109,
252,6,133,206,189,240,6,133,205,189,24
8,6,170,160,0,177,203,145,205,200
10060 DATA 202,208,248,174,253,6,169,0
,157,236,6,202,48,3,76,2,6,76,98,228,0
,0,104,169,7,162,6,160,0,32,92
10070 DATA 228,96
10080 REM PLAYER DATA
10090 DATA 15,25,49,17,29,5,13,17,23,2
14,127,95,15,15,15,15,15,15,15,15,15,1
5,15,15,6,6,6,6,6,6,6,14,10
10091 DATA 3,254,3
```

■

Memory Mapped Screens..2

Phil Griffin, West Midlands

In the last issue, I introduced the concept of the memory mapped screen and dealt with Graphics 0, 1 and 2. In this article I shall look at Graphics Modes 3 to 8 and show a simple animation sequence achieved by using POKE statements.

When values between 0 and 255 are POKEd into screen locations using Graphics Modes 3 to 8, a pattern of coloured pixels is produced at the selected screen location. Graphics Modes 3, 5 and 7 allow three foreground colours plus background whilst Graphics Modes 4, 6 and 8 allow only one foreground colour plus background. The colours obtained are the normal default colours for each mode but they can be manipulated by using the SETCOLOR command or by POKEing the relevant COLOR register.

GRAPHICS MODES 3, 5 and 7

These are the '3 colour' Modes and if you compare the horizontal resolution from the table at the back of your Basic Manual with the Screen Memory Locations per Mode Line shown in Table 1 of the first part of this article, you will see that each screen memory location is equivalent to a horizontal block of 4 pixels.

```
10 GRAPHICS 3:POKE 752,1
20 TL3=PEEK(88)+256*PEEK(89)
30 FOR I=0 TO 255
40 POKE TL3,I:? CHR$(125);"     P
OKE VALUE OF ";I:? :? "    HIT ANY K
EY TO CONTINUE":POKE 764,255
50 IF PEEK(764)=255 THEN 50
60 NEXT I
```

Program 1 shows the resultant display for each POKE value between 0 and 255. Graphics 3 has been used for the display, but similar effects occur with Graphics modes 5 and 7.

A coloured reference chart can easily be prepared using this program and I have found mine invaluable for programming animation sequences.

GRAPHICS MODES 4, 6 and 8

These are the 'single colour' Modes and each screen memory location is equivalent to a horizontal block of 8 pixels. The range of POKE values, 0 to 255, is again available but this time the resultant 'block' is a representation of the binary equivalent of the number POKEd. Each 0 becomes a pixel plotted in the background colour and each 1 becomes a pixel plotted in the foreground colour. Figure 1 should make things a little clearer.

Decimal	Binary Equivalent	Display Block
255	1 1 1 1 1 1 1 1	
0	0 0 0 0 0 0 0 0	
242	1 1 1 1 0 0 1 0	
157	1 0 0 1 1 1 0 1	
73	0 1 0 0 1 0 0 1	

Figure 1

Program 1 can be amended to a 'single colour' mode by substituting GRAPHICS 4 for GRAPHICS 3 in line 10 and TL4 for TL3 in lines 20 and 40.

Graphics Mode 8 is the highest resolution Graphics Mode available. The pixel size is so small that multicolour effects are possible by careful selection of the pixels to be plotted. This process is known as artifacting and is used quite extensively in America although it doesn't work very well on U.K. televisions. For the purposes of this article Graphics 8 can be considered as a 'single colour' mode.

GRAPHICS 9, 10 and 11

These are the additional modes available with the GTIA chip and each screen memory location is equivalent to a block of 2 pixels. The use of screen memory locations is limited in these modes due to the size of the pixels and animation techniques are best executed by use of the colour registers, particularly in Graphics 10.

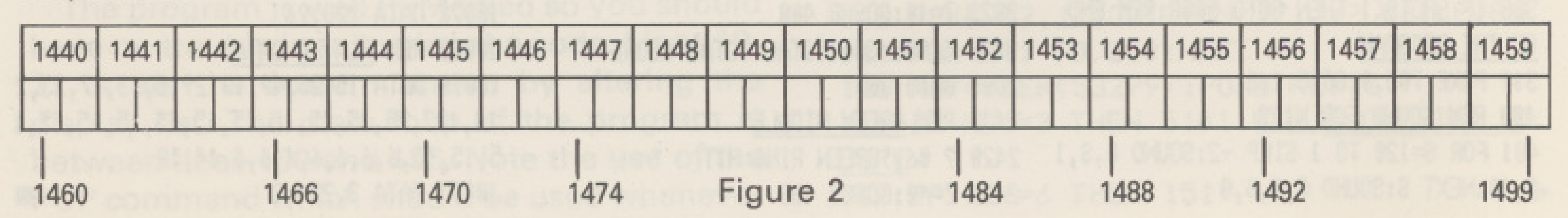


Figure 2

DEMONSTRATION PROGRAM

Program 2 uses a modified Graphics 6 screen to display six 'cities' together with a landscape which utilises the text window. The last seven lines of the Graphics 6 display have been replaced with Graphics 7 in order to record the cities and the landscape in different colours.

Twenty randomly selected laser-bolts are produced and if a city is struck, the city explodes and is then rebuilt. A score of 555 points is awarded for each hit and any necessary updating of 'score' and 'missiles remaining' is carried out before the next missile is launched. When all the missiles have been fired, a high score is shown and an invitation to re-run the program is displayed.

Every item in the screen display with the exception of the laser-bolt is produced by POKEing to the screen. Although the majority of the routines are reasonably straightforward, the following notes may help.

1. Screen Memory Locations for the Cities

Figure 2 shows the screen memory locations for the last line of Graphics 6 and the first line of Graphics 7 in the screen display used.

The numbers shown are the numbers of screen memory locations from the top left of the screen (TL6). Locations 1466, 1470, 1474, 1484, 1488 and 1492 are the start locations for the cities and they are held in the array C(1-6). Locations 1443, 1445, 1447, 1452, 1454 and 1456 are used to check whether a city has been hit and are held in the array CHK(1-6).

2. Animation Sequence

The animation sequence for the city explosion is shown in the series of Figures 3(a) onwards. Each phase of the explosion is drawn on a 7 by 8 grid. The eight horizontal pixels are actually made up of two blocks each of four pixels width. The values shown by the side of each figure are the POKE values to obtain the pattern of pixels shown in the default colour 'yellow/green'. The SETCOLOR statement in line 40 of the program changes this colour to the 'purple/blue' colour of the city. The expressions containing XP in Figure 3(a) relate to the explosion routine in lines 1060 to 1160.

3. Score, Hi-Score and Missiles Remaining

The variables S, H and M (line 30) contain the start addresses for the score, hi-score and missiles remaining screen memory locations. The arrays SC(1-5), HSC(1-5) amd M(1-2) contain the actual numerical values. The mechanics of updating these values is a little complicated but should be easier to follow if you know that the first element in the array contains the units, the second element the 10's and the third element the 100's and so on.

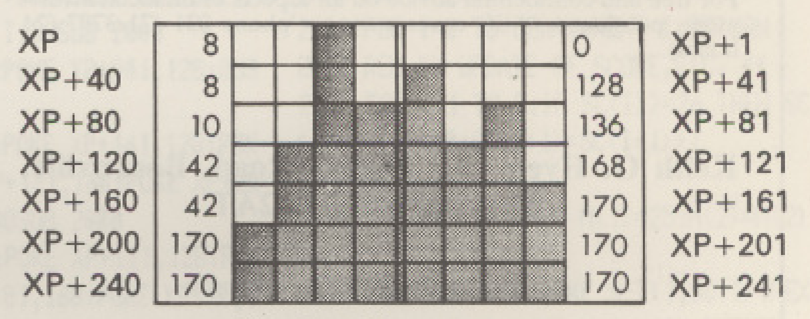


Fig. 3(a) City as set up in sub routine (line 1020)

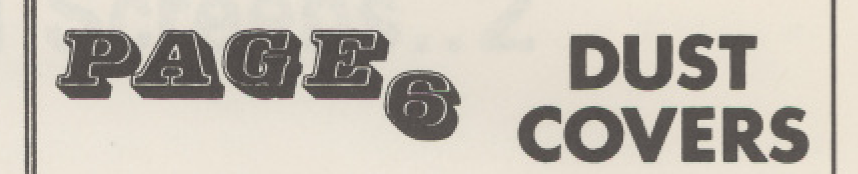
continued ▶

THE PAGE 6 AWARDS

YOUR PROGRAM, ARTICLE OR REVIEW COULD BE WORTH £50 IN SOFTWARE !

In the last issue we announced a readers' poll to be conducted at the end of our first year to find the best programs, articles and reviews from the first six issues. Since then we have been talking to a few retailers and distributors and hope to be able to offer more prizes by way of sponsorship—details will be announced in Issue 6. In the meantime, if you want to have the chance of winning and would like to get your name in print, send us a program, article or an in-depth review. Don't be shy, your work is probably better than you think!

SEND YOUR CONTRIBUTION NOW



Memory Mapped Screens continued

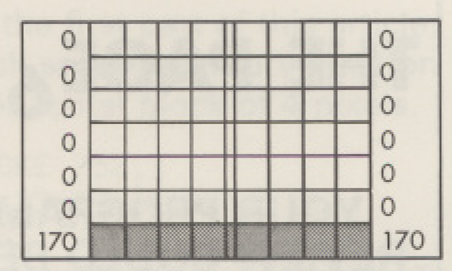


Fig. 3(b) First and final phases (lines 1060 & 1160)

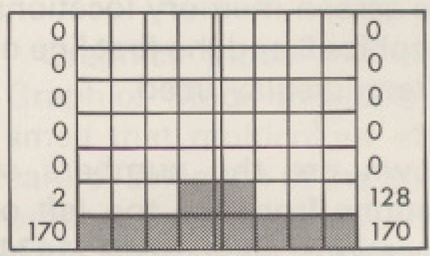


Fig. 3(c) Second phase (line 1070)

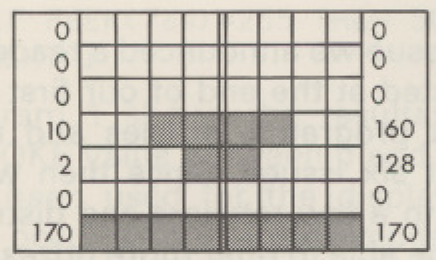


Fig. 3(d) Third phase (line 1080)

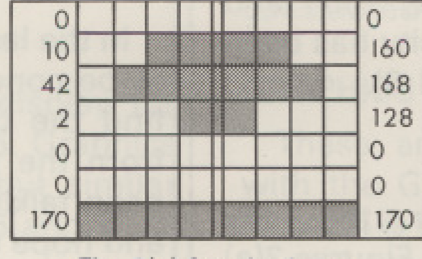


Fig. 3(e) fourth phase (lines 1090-1100)

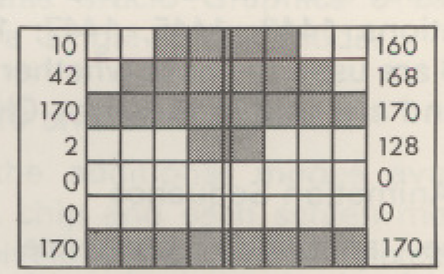


Fig. 3(f) Fifth phase (line 1110)

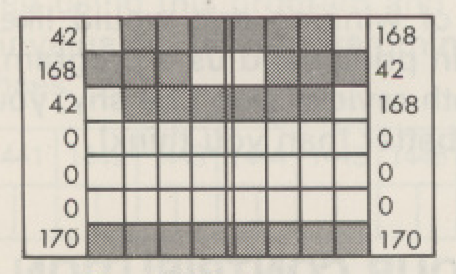


Fig. 3(g) Sixth phase (lines 1120-1130)

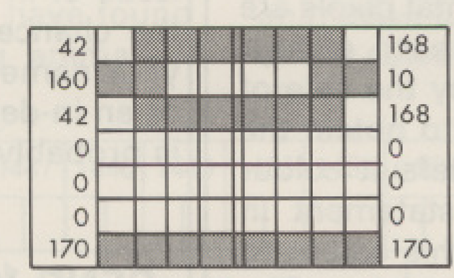


Fig. 3 (h) Seventh phase (line 1140)

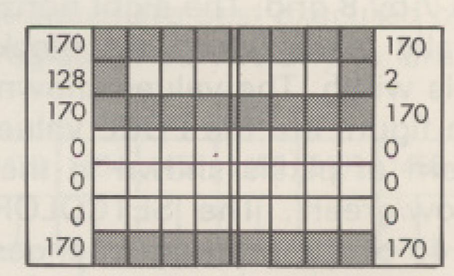


Fig. 3(i) Eighth phase (line 1150)

▶

Memory Mapped Screens continued

```
1 REM ******************************
2 REM *  DEMONSTRATION PROGRAM FOR  *
3 REM *     MEMORY MAPPED SCREENS   *
4 REM *             by              *
5 REM *  PHIL GRIFFIN - JUNE 1983   *
6 REM ******************************
9 REM INITIALISATION
10 GRAPHICS 0:POKE 559,0:TL0=PEEK(88)+
256*PEEK(89)
20 DIM C(6),CHK(6),SC(5),HSC(5),Z(5),M
(2)
30 S=TL0+857:M=TL0+872:H=TL0+946:DELAY
=30:FOR I=1 TO 5:HSC(I)=16:NEXT I
40 GRAPHICS 6:SETCOLOR 2,3,8:SETCOLOR
1,8,4:SETCOLOR 0,12,14
50 REM ** MODIFY DISPLAY LIST **
60 DL=PEEK(560)+256*PEEK(561):FOR I=78
 TO 84:POKE DL+I,13:NEXT I
70 REM ** 1ST SCREEN LOCATION **
80 TL6=PEEK(88)+256*PEEK(89)
90 REM ** DRAW LANDSCAPE **
100 FOR I=1540 TO 1740 STEP 40:FOR J=0
 TO 3:POKE TL6+I+J,255:POKE TL6+I+J+18
,255:POKE TL6+I+J+36,255:NEXT J:NEXT I
110 REM ** SET UP CITIES **
120 DATA 1466,1443,1470,1445,1474,1447
,1484,1452,1488,1454,1492,1456
130 RESTORE 120:FOR I=1 TO 6:READ A,B:
C(I)=A:CHK(I)=B:NEXT I
140 FOR I=1 TO 6:GOSUB 1020:NEXT I
150 REM ** POKE TEXT TO SCREEN **
180 GOSUB 1510:GOSUB 1610
190 REM ** ARRAYS FOR SCORE,ETC. **
200 FOR I=1 TO 5:SC(I)=16:NEXT I:M(1)=
16:M(2)=18
490 REM ** MAIN ROUTINE **
500 FOR K=1 TO 20:X1=INT(RND(0)*156):X
1=4+8*INT(X1/8):COLOR 1:PLOT 79,0:DRAW
TO X1,72
510 FOR J=100 TO 0 STEP -2:SOUND 0,J,8
,8:NEXT J:SOUND 0,0,0,0
520 FOR C=1 TO 6
530 IF PEEK(TL6+CHK(C))<>0 THEN GOSUB
2500:POP :GOTO 550
540 NEXT C
550 COLOR 0:PLOT 79,0:DRAWTO X1,72:M(1
)=M(1)-1:GOSUB 2120
560 FOR G=1 TO 200:NEXT G:NEXT K
570 GOSUB 2600
580 FOR G=1 TO 1000:NEXT G
590 POKE 764,255:GOSUB 1710
600 IF PEEK(764)=255 THEN 600
610 GOSUB 1510:GOTO 200
1000 REM ** CITY SUBROUTINE **
1010 DATA 8,0,8,128,10,136,42,168,42,1
70,170,170,170,170
1020 RESTORE 1010:FOR R=C(I) TO C(I)+2
40 STEP 40:READ A,B:POKE TL6+R,A:POKE
TL6+R+1,B:NEXT R
1030 RETURN
1040 REM ** EXPLOSION SUBROUTINE **
1050 FOR I=0 TO 3:SOUND I,255-I*20,4,8
:NEXT I
1060 FOR I=XP TO XP+200 STEP 40:POKE I
,0:POKE I+1,0:NEXT I:GOSUB 2000
1070 POKE XP+200,2:POKE XP+201,128:GOS
UB 2000
1080 POKE XP+160,2:POKE XP+161,128:POK
E XP+120,10:POKE XP+121,160:POKE XP+20
0,0:POKE XP+201,0:GOSUB 2000
1090 POKE XP+120,2:POKE XP+121,128:POK
E XP+80,42:POKE XP+81,168:POKE XP+40,1
0:POKE XP+41,160:POKE XP+160,0
1100 POKE XP+161,0:GOSUB 2000
1110 POKE XP+80,170:POKE XP+81,170:POK
E XP+40,42:POKE XP+41,168:POKE XP,10:P
OKE XP+1,160:GOSUB 2000
1120 POKE XP+80,42:POKE XP+81,168:POKE
 XP+40,168:POKE XP+41,42:POKE XP,42:PO
KE XP+1,168:POKE XP+120,0
1130 POKE XP+121,0:GOSUB 2000
1140 POKE XP+40,160:POKE XP+41,10:GOSU
B 2000
1150 POKE XP+80,170:POKE XP+81,170:POK
E XP+40,128:POKE XP+41,2:POKE XP,170:P
OKE XP+1,170:GOSUB 2000
1160 FOR I=XP TO XP+80 STEP 40:POKE I,
0:POKE I+1,0:NEXT I:FOR I=0 TO 3:SOUND
 I,0,0,0:NEXT I:RETURN
1490 REM ** SCORE/MISSILES **
1500 DATA 51,35,47,50,37,29,16,16,16,1
6,16,0,0,0,0,45,41,51,51,41,44,37,51,2
9,18,16
1510 RESTORE 1500:FOR I=847 TO 872:REA
D A:POKE TL0+I,A:NEXT I:RETURN
1590 REM ** HI-SCORE **
1600 DATA 40,41,13,51,35,47,50,37,29,1
6,16,16,16,16
1610 RESTORE 1600:FOR I=933 TO 946:REA
D A:POKE TL0+I,A:NEXT I:RETURN
1690 REM ** ANOTHER DEMO ? **
1700 DATA 48,50,37,51,51,0,33,46,57,0,
43,37,57,0,52,47,0,35,47,46,52,41,46,5
3,37,26
1710 RESTORE 1700:FOR I=847 TO 872:REA
D A:POKE TL0+I,A:NEXT I:RETURN
1990 REM ** DELAY SUBROUTINE **
2000 FOR I=1 TO DELAY:NEXT I:RETURN
2090 REM ** UPDATE OF SCORE,ETC. **
2100 FOR I=1 TO 5:IF SC(I)>=26 THEN SC
(I)=SC(I)-10:SC(I+1)=SC(I+1)+1
2110 NEXT I
2120 IF M(1)<16 THEN M(1)=25:M(2)=M(2)
-1
2130 FOR I=1 TO 5:POKE S-I+1,SC(I):NEX
T I:POKE M,M(1):POKE M-1,M(2):RETURN
2490 REM ** 'HIT' SUBROUTINE **
2500 COLOR 0:PLOT 79,0:DRAWTO X1,72:XP
=C(C)+TL6:GOSUB 1050:FOR G=1 TO 3:SC(G
)=SC(G)+5:NEXT G
2510 I=C:GOSUB 1020:GOSUB 2100
2520 RETURN
2590 REM ** ? NEW HI-SCORE **
2600 Z=0:FOR I=1 TO 5:Z(I)=(HSC(I)-SC(
I))*10^(I-1):Z=Z+Z(I):NEXT I:IF Z<0 TH
EN FOR I=1 TO 5:HSC(I)=SC(I):NEXT I
2610 FOR I=1 TO 5:POKE H-I+1,HSC(I):NE
XT I:RETURN
```

The routine in line 2600 checks for a new hi-score by calculating the difference between the existing hi-score and the new score. If the difference is less than 0 then a new hi-score exists.

I hope that at least parts of this article will be of value to you and will stimulate enough interest for you to experiment and include similar effects in your own programs. You will find that a little time spent with pen and paper beforehand will pay dividends when planning animation sequences and working out the position of screen locations. ●

NEW SOFTWARE

AIRSTRIKE by English Software Company. First of the re-releases of old chart hits! Airstrike has gained quite a reputation as being one of the hardest arcade style games. It is—and then some! Based on Scramble. This has been unavailable for some time but is now back at a lower price of £14.95. 16K cassette presumably—it doesn't say.

TIME WARP by English Software Company. Strange Action-Adventure type program running in 16K. Might take a bit of time getting into this one. ●

Across the Pond

by
Michael Lechkun
(Michigan Atari Computer Enthusiasts)

Hello from Michigan! We're anxious to hear about our fellow Atarians in the U.K. We also want to let you know what's going on here in the U.S.

So, what's the latest from the U.S.A.? I had the pleasure of attending the International Summer Consumer Electronics Show held this past June in the City of Chicago. On display were the latest in anything electronic including telephones, satellite-TV technology, audio disk players, computers and some new introductions by your friends and mine from Sunnyvale, ATARI Inc.

At the show ATARI introduced four (yes, four!) new computers. They are the 600XL, 800XL, 1400XL and 1450XLD. The 600XL is a 16K machine upgradeable to 64K. It has a full-stroke keyboard (no more membrane keys—yeah!). The 800XL is a 64K featuring built-in Basic like all the new machines and also a monitor output. The 1400XL features built-in modem and speech synthesis via a Votrax chip. It has 64K and like the 600XL and 800XL is in similar style to the 1200XL.

What of the 1200XL? Seemed strange, but I didn't see too many there. In fact in three days the only one I saw was the one ATARI used for demonstration. Anyone who displayed ATARI software used an 800. I overheard that changes were to be made to physically accept third party cartridges and the OS changed to run third party software. Another rumour is complete phasing out of the unit, but don't quote me on any of this.

The ATARI 1450XLD. Ah, yes. " With built-in disk drive, it's the ultimate in integrated computer capabilities ", or so say the boys from California. Double-sided dual density built-in disk drive, 64K and CP/M upgradable through access to the serial buss and expansion module, ATARI you HAVE been listening to us after all! The 1450XLD also sports the built-in phone modem and speech synthesis capabilities of the 1400XL. All the

continued on page 19

The Sting

There are many ways to produce music on your Atari but this one is very different. I don't mind admitting it gave me quite a shock when I ran it! Try it yourself.

```
0 REM ********************************
1 REM * THE STING  BY BRENT BORGHESE *
2 REM *                              *
3 REM *        REPRINTED FROM        *
4 REM *    ACE OF COLOMBUS, OHIO     *
5 REM *       VIA ACE OF OREGON      *
6 REM ********************************
8 K=300
9 FOR R=0 TO 33:READ Z:POKE 1538+R,Z:N
EXT R
10 READ A
21 IF A=255 THEN END
25 REM SOUND 0,A,10,10
30 Z=USR(1538,255-(A*1.3),A)
50 FOR L=1 TO 32:NEXT L
60 GOTO 10
62 DATA 104,104,104,133,205,104,104,13
3,204,169,255,141,31,208,164,204,136,2
08,253,169
63 DATA 0,141,31,208,164,204,136,208,2
53,198,205,208,232,96
70 DATA 108,102,96,60,86,60,96,60,53,5
0,47,80,53,47,47,64
80 DATA 53,60,108,102,96,60,96,60,96,6
0,72,81,85,72,60,47,53,60
90 DATA 53,108,102,96,60,96,60,96,60,5
3,50,47,60,63,47,46,64,53,60,60
100 DATA 53,47,60,53,47,47,60,53,60,47
,60,53,47,47,60,53,60,47,60,53,47,64,5
3,60
110 DATA 108,102
200 DATA 108,102,96,60,96,60,96,60,53,
50,47,60,53,47,47,64
210 DATA 53,60,108,102,96,60,96,60,96,
60,72,81,85,72,60,47,53,60
220 DATA 53,108,102,96,60,96,60,96,60,
53,50,47,60,53,47,47,64,53,60,60
225 DATA 53,47,60,53,47,47,60,53,60,47
,60,53,47,47,60,53,60,47,60,53,47,64,5
3,60
230 DATA 60,96,91,85
300 DATA 108,102,96,60,96,60,96,60,53,
50,47,60,53,47,47,64
310 DATA 53,60,108,102,96,60,96,60,96,
60,72,81,85,72,60,47,53,60
320 DATA 53,108,102,96,60,96,60,96,60,
53,50,47,60,63,47,47,64,53,60,60
325 DATA 53,47,60,53,47,47,60,53,60,47
,60,53,47,47,60,53,60,47,60,53,47,64,5
3,60
330 DATA 60,255
```

■

Squares

John Massara, Five Dock, New South Wales

Squares is an arcade-type game which requires a lot of skill and very little luck. The object of the game is to guide an ever-growing white line using your joystick and cause it to run over the black squares to score 'hits'. Each hit gives you points according to the frame as well as adding another square to the playfield. Points are also awarded just for keeping the white line moving without hitting any squares. After one or two games you will realise that you can score a lot more hits by running along the side of a square rather than just passing through the middle, however this requires more skill. You get bonus points at the completion of each frame.

As you progress through the frames, the squares get smaller and the line moves faster until you reach the dreaded 8th frame where the size of the square is the same as a GRAPHICS 7 pixel! The game will finish if you hit the border or run into yourself. If you run into a 'dead end' situation, you can use the 'escape' option by pressing and holding the fire button. The line will stop moving so that you can have a good look at the screen. When you are ready, let go the button and the line will reappear in a new location for you to carry on.

Finally, if you wish to skip frames, just press the OPTION key while playing.

```
1 REM ##################################
2 REM #           SQUARES              #
3 REM #       by John Massara          #
4 REM #    Originally Published by     #
5 REM # Atari Computer Enthusiasts     #
6 REM #           (N.S.W.)             #
7 REM #        December 1982           #
8 REM ##################################
10 FRAME=1:SC=0:FQ=160
20 SIZE=ABS(8-FRAME):DELAY=15/FRAME:BA
CK=FRAME+2:FINAL=20*FRAME:COUNT=0:HITS
=0:SQUARES=0
30 GRAPHICS 7:SETCOLOR 2,0,0:SETCOLOR
0,0,14:SETCOLOR 1,1,8:SETCOLOR 4,BACK,
4:POKE 752,1
40 DX=1:DY=0:X=90:Y=40:COLOR 2:PLOT 0,
0:DRAWTO 159,0:DRAWTO 159,79:DRAWTO 0,
79:DRAWTO 0,0
50 ? "FRAME: ";FRAME;:POKE 657,19:? "H
IGH SCORE: ";HS
60 ? :? "HITS: ";HITS;:POKE 657,13:? "
NEED: ";FINAL-HITS;:POKE 657,24:? "SCO
RE: ";SC;
70 A=RND(0)*140+10:B=RND(0)*65+5:COLOR
 3:PLOT A,B:DRAWTO A+SIZE,B:DRAWTO A+S
IZE,B+SIZE:DRAWTO A,B+SIZE:DRAWTO A,B
80 SQUARES=SQUARES+1
90 COLOR 1:LOCATE X,Y,Z:IF Z=1 THEN ?
:? :? "        YOU RAN INTO YOURSELF!":
GOTO 240
100 IF Z=2 THEN ? :? :? "       YOU RAN
 INTO THE BORDER!":GOTO 240
110 INC=INC+1
120 PLOT X,Y:FOR D=1 TO DELAY:NEXT D:I
F Z=3 THEN 310
130 IF PEEK(53279)<>3 THEN 160
140 FRAME=FRAME+1:IF FRAME>8 THEN FRAM
E=1
150 GOTO 20
160 S=STICK(0):IF S=15 THEN 210
170 POKE 77,0:IF S=14 THEN DX=0:DY=-1
180 IF S=13 THEN DX=0:DY=1
190 IF S=11 THEN DX=-1:DY=0
200 IF S=7 THEN DX=1:DY=0
210 IF STRIG(0)=1 THEN 230
220 X=RND(0)*150+2:Y=RND(0)*70+2:GOTO
210
230 X=X+DX:Y=Y+DY:GOTO 90
240 FOR W=1 TO 1000:NEXT W:IF SC>HS TH
EN HS=SC
250 GRAPHICS 0:SETCOLOR 2,11,4:SETCOLO
R 4,11,4:SETCOLOR 1,11,10:POKE 752,1
260 POSITION 14,5:? " GAME OVER ":POSI
TION 10,9:? " YOUR SCORE:   ";SC
270 POSITION 10,11:? " HIGH SCORE:   ";
HS
280 POSITION 5,15:? "Press  START  or
 FIRE BUTTON ":POSITION 13,17:? "for a
 new game"
290 POKE 755,0:IF PEEK(53279)=6 OR STR
IG(0)=0 THEN POKE 77,0:GOTO 10
300 POKE 755,2:GOTO 290
310 SOUND 0,FQ,10,10:X=X+DX:Y=Y+DY:SC=
SC+100*FRAME+INC:INC=0:SOUND 0,0,0,0:H
ITS=HITS+1:SQUARES=SQUARES+1
320 POKE 657,8:? HITS;:POKE 657,19:? F
INAL-HITS;" ";:POKE 657,31:? SC;
330 IF HITS<FINAL THEN 70
340 BONUS=(SQUARES-HITS)*100*FRAME:SC=
SC+BONUS:FRAME=FRAME+1
350 ? :? :? "     BONUS POINTS ------>
 ";BONUS:FQ=FQ-20
360 FOR E=1 TO 4:SOUND 0,30,10,10:POKE
 755,0:FOR W=1 TO 50:NEXT W:SOUND 0,0,
0,0
370 POKE 755,2:FOR W1=1 TO 30:NEXT W1:
NEXT E
380 FOR W=1 TO 500:NEXT W:GOTO 20
```

■

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ARCADE ACTION . . . MINER 2049er

Harvey Kong Tin, Hull

If I were to choose just one game to show that the Atari was superior to all other machines, Miner 2049er would be it. I would just leave the game running unattended for it cycles through an introductory title sequence, accompanied by the music of 'Clementine' and then gives a demo of how you might clear Station One and a high score table.

The game is a derivative of the arcade game Donkey Kong but is totally different. Miner requires you to jump confidently and know where to jump to next because you only have a limited amount of time to clear each station. The theme is that of a space age miner who must claim all sections of the framework of each station in a mine. The mine is patrolled by deadly alien mutants but these can be banished in PacMan style by picking up an object from the many scattered about and touching them quickly. When you pick up an object the mutants change into a harmless vulnerable form but only temporarily so you must be quick. There are ten stations altogether, each different and each with their own particular hazards. If you plan your journey carefully, you do not need to jump over any deadly mutants except on Station Ten where you are forced to jump them to clear the Station.

Let's go through the various Stations.

STATION ONE—The Mine Shaft. An easy screen to conquer, just get used to climbing ladders and banishing mutants. There is even one jump to make to prepare you for the next levels.

STATION TWO—The Slides. A difficult screen for beginners. There are ladders, jumping and jumping over slides. Going down slides unnecessarily is the real killer because you can run out of time.

STATION THREE—The Transporters. An easy screen after the last one, just ladders and the transporters—Beam me up, Scotty! There are some safe drops you can use to save time.

STATION FOUR—The Lillypads. Another difficult screen. At first you will have trouble knowing where to go to cover the pads, there are so many of them. Once you know the directions to take, jumping practically all the way, you have only one difficult jump to make but it will really test how far you can jump.

STATION FIVE—Advanced Lillypads. Similar to Station Four with many pads to cover but with slides at the top. You'll have to tread and jump carefully to cover them. Finally, there is a moving piece to land on—best jump for it—to cover the remainder. A word of warning, there is one object here you can't have.

STATION SIX—The Radioactive Waste. At first this is another difficult one for having got used to running jumps, you here have to make standing jumps. There is an all important moving piece to ride on to cover an isolated part of the screen. Going there is no problem, it's getting back, the moving piece is so small.

STATION SEVEN—Advanced Transporters. As the instruction book says 'This round has got it all!' Transporters, slides, moving pieces and lillypads. Mapping out this one is very difficult as there are so many places to go. Only experience will get you through this one.

STATION EIGHT—The Lift. The first thing you notice is the Lift dominating the centre of the screen. This is used to access the areas out of reach. The layout seems simple enough but there are many traps here—places you can't get out of once you have landed there.

STATION NINE—The Pulverisers. Another easy layout on first sight but you have to get used to the parked moving pieces—jumping off is not easy—and going under the pulverisers. There is a safe way to negotiate them.

STATION TEN—The Cannon. You have a giant cannon at your disposal. To use it you need the correct amount of dynamite to blast you to the appropriate storey you wish to cover. Storeys 2 and 3 are not too bad but the first storey is difficult. Here on Station Ten you are forced to jump the mutants and the major factor against you is time, but once the different storeys are clear you can confidently gather the remaining TNT and thereby start Miner all over again but at the next difficulty level—ZONE 2. There are TEN zones in all! ►

The really good thing about Miner is that it is playable many times over but you do have to go through all the earlier stations if you are stuck on a difficult one. You will need the practice anyway to conquer Station Ten.

Even past Station Ten you will find the game challenging, you can preselect the more difficult zones 2-10 and see how far you can get on these. It is possible to get yourself up to Station Ten on Zone 5 but you do need to change your tactics entirely as the mutants speed up considerably and they don't remain in a harmless state when you want to zap them. On Zone 10 it becomes impossible to clear Station Three, there is no way I know of clearing it!

Jumping has become a part of some of the latest games out—Donkey Kong, Pharaoh's Curse, Shamus Case II and Jumpman, but Miner 2049er ranks as the best. Miner is the cleverest, most imaginative game out. The animation is superb as it uses high resolution graphics and even the colours of the framework of the mine change. Atari's Mario the Carpenter in Donkey Kong does not match Bounty Bob in quality.

Bill Hogue founded Big Five and started producing arcade games for TRS-80 computers. Miner for the Atari was a complete surprise but with the undoubted success of this game, Big Five is ready to release more than one new title for its Miner followers. Believe it or not it will soon be one year since the release of Miner 2049er.

FOOTNOTE: I have since discovered that you can type in Big Five's phone number during play and then press SHIFT followed by the Station you wish to go to rather than go through all the Stations. On zone 10 you can only clear Stations 1, 2, 5, 6, 7, 8 so the challenges in this game are always present even for the experienced player. ●

WHOOPS! ... ERROR 17

Last issue had an error in the Grab An Apple listing. Line 1160 should have DL1160 deleted.

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Vertical P/M Movement

Andrew Jones, Birmingham

Moving Players and Missiles horizontally is quite easy from Basic using the horizontal registers 53248-53255, but vertical movement is a problem as there are no registers for vertical movement. Using Basic to redraw the image is agonisingly slow and unsatisfactory, so here is a machine language routine to move Players and Missiles vertically. There are plenty of REMarks in the listing to enable you to follow the procedure for setting up Players.

```
10 REM ** VERTICAL PLAYER MOTION **
11 REM *         by               *
12 REM **     ANDREW JONES       **
13 REM
100 REM MACHINE CODE FOR VERTICAL
 MOVEMENT
110 FOR I=1536 TO 1575:READ A:POKE I,A
:NEXT I
120 DATA 104,104,133,95,104,133,94,160
,1,177,94,136,145,94,200,200,192,127,2
08,245,96
130 DATA 104,104,133,95,104,133,94,160
,127,177,94,200,145,94,136,136,208,247
,96
140 UP=1536:DOWN=1557
149 REM SET UP PLAYER MISSILE GRAPHICS
150 M=106:P=PEEK(M):P=P-8:PM=54279:POK
E PM,P:MY=P*256
160 POKE 559,46:REM DEFINE DOUBLE LINE
 RESOLUTION
170 POKE 53277,3:REM TO ENABLE PMGRAPH
ICS
180 FOR I=MY+512 TO MY+639:REM CLEAR O
UT PLAYER MEMORY
190 POKE I,0:NEXT I
200 REM SET UP PLAYER 0
205 X=100:Y=50
210 PLAYER0=MY+512:REM LOCATION IN MEM
ORY OF PLAYER0
220 FOR I=MY+512+Y TO MY+520+Y:READ A:
POKE I,A:NEXT I
230 DATA 24,153,255,153,153,153,60,126
,129,129:REM SHAPE OF PLAYER
240 POKE 704,175:REM COLOUR OF PLAYER0
250 HP=53248:POKE HP,X:REM STARTING PO
SITION
260 SETCOLOR 2,0,0:REM BACKGROUND
300 S=STICK(0)
320 IF S=13 AND Y<115 THEN A=USR(DOWN,
PLAYER0):Y=Y+1
330 IF S=14 AND Y>10 THEN A=USR(UP,PLA
YER0):Y=Y-1
340 IF S=7 THEN X=X+1:IF X=220 THEN X=
40:POKE HP,X
350 IF S=11 THEN X=X-1:IF X=40 THEN X=
220
360 POKE HP,X
370 GOTO 300
```

■

This is the first article PAGE 6 has had on Player-Missile Graphics, one of the most powerful features of the Atari. It is also a feature which causes much anxiety in beginners. How about some more articles and listings from those of you who have got to grips with PM Graphics?

Across the Pond continued

new models incorporate the HELP key and are expandable via the new 1060 expansion module (get out your 80 column boards again!).

Also new from sunny California are ATARI's letter quality printer (1027), dot-matrix printer (1025) and printer/plotter in four colours (1020). A new cassette recorder (1010), direct connect phone modem (1030), dual density disk drive in the slim-line styling (1050) and DOS 3.0 to support it. Also a trak-ball, touch graphics tablet and VCS 2600 keyboard and compuuter adaptor—called "My First Computer" and under $90—all proud additions to the ATARI line.

You want PAC-MAN but don't have an ATARI computer? Well, ATARI won't deprive you of it much longer. It's exclusive titles are now coming out for the IBM-PC, TI99/4 as well as the VIC 20. ATARI owners will also see DIG-DUG, JOUST and DONKEY KONG JR coming out for the world's best computer.

Some other show stoppers at ISCES: Colecovision's new ADAM computer system and Mattel's AQUARIUS both complete systems for a low, low price. Also AMDEK had a complete display of monitors and their new 3½ inch (I mean 9cm) cartridge-disk drive for the ATARI.

If all these surprises aren't enough for you, you'll have to wait for next winter's show in Las Vegas. If you can't get away, watch for my report following the show.

Michael Lechkun.

Typo

by

William Wilkinson

One of the biggest problems in typing in magazine listings is to make sure that you have typed in the program correctly. Many readers have asked if there is a solution to this problem but there is no magic answer, a lot of care and hard work are involved even if you use a utility such as TYPO.

TYPO is used by ANTIC magazine and was first published by them in August 1982. It is reprinted here with their permission. In future we will include a TYPO chart with all but the shortest listings in PAGE 6 which will hopefully help you to correct those bugs.

TYPO will produce a chart which you then compare with the chart printed in the magazine. BE WARNED though, TYPO is very fussy and you must type in the listing exactly as shown—every REM, space and comma, lower case etc. must be the same. TYPO will help you get an identical listing but you still have to search out and correct mistakes. At least the line numbers will be narrowed down.

Here's how to type in the listing. First type in the program exactly as shown (including the REM) and LIST it to disk (LIST"D:TYPO") or cassette (LIST"C:"). Next type NEW and then ENTER the program again (ENTER"D:TYPO") or (ENTER"C:"). Now change the number 32000 in lines 32180 and 32200 to 32500 and RUN the program. Compare the chart with the printed chart. If they are different, check through the listing, make any corrections and go through the procedure again. When the charts agree, change the numbers 32500 back to 32000 in the above lines and LIST the program to a new disk or tape. This is your master TYPO program.

TYPO IN USE

Follow this procedure exactly:

1. Type in a listing from the magazine.
2. LIST the program to disk (LIST"D:NAME") or cassette (LIST"C:").
3. Type NEW.
4. ENTER the program (ENTER"D:NAME") or (ENTER"C:").
5. Change to the disk or cassette with TYPO on and enter TYPO (ENTER"D:TYPO") or (ENTER"C:").
6. Type GOTO 32000. Type S for output to the screen or P for printer. The program will produce a chart. If the chart agrees with the one in the magazine, you have an identical listing. Well done!
7. The chart doesn't agree, does it! Examine the lines which do not agree and correct any errors.
8. IF THE VARIABLE CHECKSUM AGREES go to step 6.
9. If the variable checksum does not agree, you MUST go to step 2 but you can skip step 5 as TYPO will already be on the end of your program.

HINTS ON FINDING ERRORS

If the variable checksum does not agree, you have either typed in lines in wrong order or mispelled a variable name. See the next paragraph to narrow down the area of error, and make the corrections. You must now go through the LIST/NEW/ENTER procedure again to put the variable name table in correct order.

The Length shown is the number of bytes within the program lines shown. The two letter code is essentially a checksum of "length" bytes within that range. If the length is correct and the code is wrong, you have made a spelling or punctuation error. Be careful though, as all keywords and operators are stored as one byte and the length might stay the same even though you type COLOR instead of SETCOLOR. If the length disagrees, you have added or deleted characters or spaces. If nothing obvious shows, pay special attention to REM statements, every space must be there.

TYPO will get you an identical listing (eventually) but don't think it will do it automatically. You still have to search for errors and correct them but at least you will have an idea where they are. ▶

```
32000 REM *TYPO -from ANTIC magazine *
32100 CLR :DIM Q$(20):QF=7:CLOSE #QF:?
 "File for output ";
32110 INPUT Q$:OPEN #QF,12,0,Q$:QREM=0
32130 QCNT=1:FOR QADDR=PEEK(130)+256*P
EEK(131) TO PEEK(132)+256*PEEK(133)-1
32140 QSUM=QSUM+PEEK(QADDR)*QCNT:QCNT=
QCNT+1:NEXT QADDR
32150 ? #QF;"Variable checksum = ";QSU
M:? #QF
32160 QADDR=PEEK(136)+256*PEEK(137):?
#QF;"   Line num range     Code   Length
"
32170 QLINE=PEEK(QADDR)+256*PEEK(QADDR
+1)
32180 IF QLINE>=32000 THEN END
32190 QLEN=0:QSUM=QLEN:QCNT=QLEN:? #QF
;"     ";QLINE,"- ";
32200 IF  NOT (QCNT<12 AND QLEN<500 AN
D QLINE<32000) THEN 32270
32220 QLEN=QLEN+PEEK(QADDR+2):QCNT=QCN
T+1
32230 IF PEEK(QADDR+4)=0 AND QREM THEN
 QADDR=QADDR+PEEK(QADDR+2):GOTO 32260
32240 FOR QADDR=QADDR TO QADDR+PEEK(QA
DDR+2)-1
32250 QSUM=QSUM+PEEK(QADDR):NEXT QADDR
32260 Q$=STR$(QLINE):QLINE=PEEK(QADDR)
+256*PEEK(QADDR+1):GOTO 32200
32270 QSUM=QSUM-676*INT(QSUM/676):QCNT
=INT(QSUM/26)
32280 ? #QF;Q$,CHR$(65+QCNT);CHR$(65+Q
SUM-26*QCNT);"     ";QLEN
32290 GOTO 32180
```
■

Typo Tables

SQUARES

Variable checksum = 586699

Line num range	Code	Length
1 - 30	BW	562
40 - 90	RE	506
100 - 210	LL	462
220 - 290	BM	552
300 - 370	BD	548
380 - 380	LR	37

COLOUR SELECTOR

Variable checksum = 180383

Line num range	Code	Length
1 - 40	XH	410
99 - 510	UW	513
520 - 560	QA	500
570 - 650	XM	534
660 - 1130	ZP	513
1199 - 1280	CF	513

TYPO

Variable checksum = 50796

Line num range	Code	Length
32000 - 32200	BF	514
32220 - 32290	WQ	310

TARGET

Variable checksum = 678189

Line num range	Code	Length
10 - 22	YN	500
70 - 142	RV	512
143 - 154	IV	492
160 - 185	OH	314
191 - 210	UV	530
220 - 1002	NT	502
1005 - 2020	FQ	520
2025 - 2210	PS	335
2220 - 2410	HX	490
2420 - 9010	LF	368
9020 - 10010	OO	508
10020 - 10060	IF	509
10070 - 10091	AL	140

MEMORY MAPPED SCREENS DEMO

Variable checksum = 365756

Line num range	Code	Length
1 - 40	RP	565
50 - 140	WZ	511
150 - 550	AK	576
560 - 1050	VF	416
1060 - 1110	HP	560
1120 - 1500	SH	569
1510 - 2100	VW	506
2110 - 2600	GU	505
2610 - 2610	PW	49

THE STING

Variable checksum = 70275

Line num range	Code	Length
0 - 25	RY	372
30 - 200	WD	549
210 - 330	QJ	494

THE SOFTWARE REVIEWS

A.C.E. The Atari Cassette Enhancer

ENGLISH SOFTWARE CO. 4K CASS.

If you write programs or type in listings from magazines and use a cassette, *BUY THIS PROGRAM* before you buy another piece of software. Your £7.95 will be the best investment you made since you bought your Atari.

What? You want to know why? Well, of prime consideration, A.C.E. verifies programs saved to tape, that is, you can save a program and then check to see if the recording is good without losing the program from memory. That's not all it does, A.C.E. has a host of other features. The program is in three sections which need not all be loaded if you do not require the facilities of a particular section. Option A gives you the facilities of saving and loading named programs, verifying, searching a tape for a specific program, getting a catalog of all programs on a tape and flashing the cursor. This section will take 2298 bytes of memory. Option B will give, in addition, a list of all variables and their current values at any stage, automatic line numbering and renumbering. This will take 3496 bytes in all. Finally, Option C gives you the ability to save and load binary files and hex/dec/binary conversions. This will bring memory usage up to 4148 bytes. As I said, you only need to load Option A if you want but you can't get the other options without having the previous one.

When you start a program session, boot in A.C.E. first and just leave it there. A.C.E. will remain resident until power-off and can be called at any time by preceding a command with @ (above the figure 8 on the keyboard). When you want to save your program you can name it as you would with a disk drive by typing CSAVE "Program Name" and then ask A.C.E. to verify that the SAVE was good by typing @ VERIFY "Program Name". Your original program will remain in memory so if the save was bad, try again. No more lost programs. When you want to load a program, there is no need to know where it is on tape, just wind the tape back to the beginning and type @ CLOAD "Program Name" or @ CRUN "Program Name" and A.C.E. will go through the tape until it finds the program and will then load or load and RUN it automatically. No more problems in positioning the tape exactly.

The Option B facilities work just as well. Automatic line numbering may seem a luxury but can be quite a time saver when you get used to it, but the real power of this section is in the DUMP and RENUMBER routines. Renumber is so fast that you have to double check that it has been done. It can't change variables if they are used as line numbers but a REPORT facility allows you to identify all such variables in the program and change them manually. The DUMP routine will give you a full list of all variables with their current values to enable you to tidy up or keep track of your programs.

The Option C facilities are perhaps the least useful as you are most likely to have a disk drive if your programming is advanced enough to use binary files.

Taking into account that the majority of users, in this country at least, will not have disk drives, this is without doubt the finest Atari utility yet produced. It cannot be recommended too highly. Buy one now before English Software realise that they have a real gem they are selling at a ridiculous price!

DOODLEBUG

SOFLOW SOFTWARE 16K/48K CASS.

Doodlebug is a drawing program which is suited to children of all ages (including middle-age!) as well as artistically inclined adults. With a little bit of knowledge in loading files, it could also serve as a very useful utility to add graphics to your programs. The program uses Graphics 11 to allow you 16 colours on the screen and drawings are made by using the joystick to move a cursor to the drawing position and then pressing the fire button to mark a point. Move the cursor to a new position and a line will be drawn connecting the two points. If you want continuous drawing,press the SELECT button. Along the bottom of the screen are 16 'paint pots' and you change colours by 'dipping' your cursor in a pot and

pressing the fire button. One very useful facility is being able to change the whole background colour by dipping your cursor in a pot and pressing OPTION.

Drawings made are saved to tape or disk as files. If Soflow could supply a short listing to purchasers which would enable these files to be loaded into other programs, then Doodlebug would become a very useful graphics utility at a very reasonable price.

If you are at all artistically inclined, Doodlebug will allow you to compose some very sophisticated pictures and then save them to impress your family and friends later. If you have kids, just load in the program and give them a joystick, it will keep them quiet for hours.

A couple of minor criticisms are the lack of a fill command for covering areas you have boxed in and the fact that the cursor moves very slowly. Perhaps I am too impatient. The company sent me a tape with a ready-made picture and very impressive it was. With a little time you should be able to produce similar drawings.

Soflow promise to bring out a range of Atari programs at about £6.50 which must be good news. Doodlebug is a promising start. It does not claim to give all the facilities of Atari's new Paint, but then it does not cost £30.

MAGIC WINDOW

QUICKSILVA 16K CASS.

Would you buy an Atari program from a company whose main products are for the ZX81 and the Spectrum? No, neither would I, but in the case of Magic Window from Quicksilva, both you and I would be missing out on a really excellent program.

Magic Window is a Character Generator controlled entirely by the joystick which enables you to create any number of character sets and save them to tape to be merged into your own programs. The program creates a routine which occupies lines 0 to 11 of a program and you need to only make sure that you don't use these lines in your program. Ready the cassette with you character set on and type "ENTER"C:". That's it. Nothing more to do. When you run your program, the character set will be automatically changed, there is nothing for you to work out.

The screen display gives you a large 8 x 8 grid on the upper left in which you plot or unplot points by pressing the joystick fire button, and a range of menu options to enable you to edit characters from the existing set. You choose an option by moving the cursor over the item and pressing the trigger. Two characters sets are shown on the screen, the standard Atari character set and the new set you have created. You can place images you have created anywhere in the new set. In the centre top is a small grid which holds 16 characters altogether so that you can see how your redefined characters will look when printed next to or above each other. This is particularly useful if you need to create an image which is too big for a single character. You can mix characters quite freely in this grid.

One of the real joys of this program is that it supports the Antic modes 4 and 5 which give you the equivalent of five colours on a Graphics 0 screen. There are limitations though and characters are very difficult to design in these modes as you are effectively limited to 4 pixels width in each character. Using Magic Window however takes away all the problems although you still need some imagination to produce good images. One of the menu options gives you Data for the image and this is particularly useful in Antic modes 4 and 5 where you will probably need only a few characters redefined to include in your own program. You don't have to use Magic Window's save and load facilities if you know the data make-up of your new character.

I find that using character editors still leaves problems in design. For example, just where do you put all those tails and squiggles to get script writing? It is not easy if you are not artistically inclined. No problem with Magic Window, there are three character sets already defined on the tape, just load one in and take a look. The character sets are script, a

C. S. Software

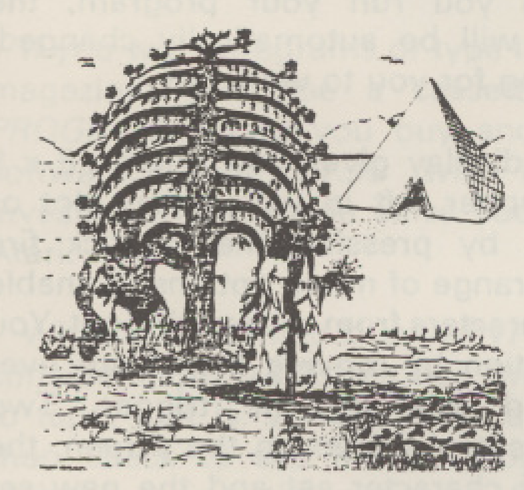
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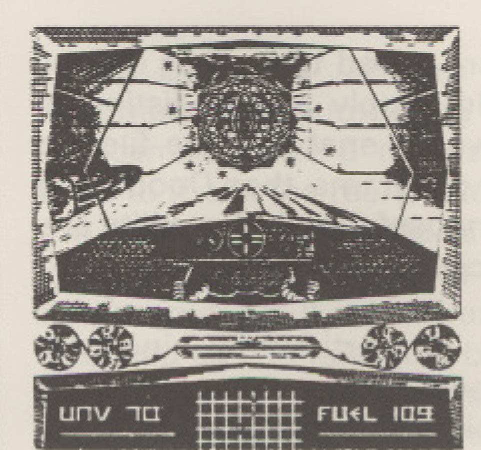


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demonstration of artifacting in Graphics 0 and a full-blown demonstration of combining characters in Antic 4 or 5 to produce space invaders, animals or little men. Even if you never design a character set of your own, Magic Window is worth the money just to be able to include one of its ready defined sets in your own program.

I picked this up out of curiosity and have ended up writing games which I would not have attempted before. It really is that easy to use that anyone who can write simple programs can have a whole new programming world opened up to them. Another one highly recommended at a very reasonable price.

VENUS VOYAGER 16K CASS.

ENGLISH SOFTWARE CO.

1 PLAYER

Venus Voyager is a space navigation and rescue game in which you have to navigate your spacecraft down fissures in the planet's surface in order to rescue six men who are stranded in underground caverns. The screen display uses display list interrupts to give graduated bands of colour which gives a nice effect but the graphics of the fissures are a bit blocky. There are a good number of hazards about including space mines, power stations and an orbiting supply ship which often gets in the way.

The game seems simple enough but is in fact very difficult to play. You control your craft by moving the joystick left or right and by pressing the fire button to apply thrust to slow down your descent. Gravity has quite a strong effect on this planet. The problems come in trying to get down the fissures for the spacecraft seems to float about a little too freely. There is only just enough room in the fissures to navigate and they all have little twists and turns. If you do manage to get to the bottom of a fissure, the screen changes to give you an enlarged view of the lower part of the cavern with your stranded compatriots in an underground bunker. There are a couple of landing pad protectors floating about but these do not give too much trouble. The landing pad however is only just big enough for your craft and you must land at the right speed as well as squeeze onto the pad. If you land, the man to be rescued will come to your craft and wave goodbye to enable you to start another rescue. Do this six times in all and you will progress to the next level although goodness knows how difficult that is.

As well as navigating problems, you have to keep an eye on your fuel and either dock with the supply ship or land on a pad to refuel. Again, watch your speed—it must be precise. With all of the hazards and the difficulty in precisely controlling your craft, Venus Voyager is a very difficult game to play and this has been confirmed by someone who has scored over 3 million on Defender! Try it if you dare.

Listing Conventions

From this issue the program listings have a different format making them hopefully easier to follow.

As far as possible, the listings will be 38 characters wide to allow you to match up to the screen, but where control characters are explained in a line this will not be possible.

Three types of characters are difficult to reproduce in a listing—Inverse, Control and Inverse Control.

INVERSE—all characters to be typed in inverse are underlined.

CONTROL—characters which require the CTRL key to be pressed are shown in square brackets [ ]. Press CTRL and the key shown in the bracket. Characters which require the ESC key to be pressed first will show ESC,CTRL followed by a word or words to describe the key to be pressed. You may have to refer to your Basic Reference Manual if you do not understand some of the keys.

INVERSE CONTROL—characters will be shown in pointed brackets <>. Follow the instructions for control characters but press the Atari key first.

The listings should be typed as accurately as possible and MUST be typed exactly if TYPO is used to check them.

All programs featured in PAGE 6 will run in 16K unless otherwise stated.

First Steps

Les Ellingham

No-one sent in any suggestions for improving John Dimmer's program in issue 4 and I can therefore only assume that readers of this column are either not advanced enough to attempt changes in programs or else nobody reads the column because it is too basic (pardon the pun). Unless readers really do want a column on hints and tips when first starting and show it by writing in , this may be the last First Steps.

As nobody else was brave enough, I will see if I can find any areas for improvement in John's program. Firstly though let's look at the good points of the program.

Any program should have some sort of introduction to show that something is happening once you hit return. With short programs this may not be too important, but once you get to writing programs which require a lot of initialisation, there may be quite a wait with a blank screen before the user realises that the program is actually running. Not so good. John's program has a title and line 9 is an excellent idea as, whilst the words are not strictly true (i.e. the main program is not actually loading), the user is expecting to wait a short while. Further on, line 75 opens the keyboard for getting characters without pressing RETURN. This can be important for non-computerists, for if they are asked to press a key, why should they think of pressing another key as well? Write your programs with others in mind. Redefining the character set was a brave step in a simple program but is well worth trying. The £ sign produced is perhaps too large though—try using DATA 0,62,54,48,120,54,126,0.

The main limitation in the program is in actually defining fixed categories within the program code which requires you to actually change the code if you want different categories. There is an advantage in that you can CSAVE the program without learning about printing strings etc. to tape and you do not have to know about string manipulation. There is a better way though of including the categories without resorting to string storage and that is to use READ and DATA. If you also place the figures for each category in an array, changing the categories would require only changes in one or two lines. Take lines 83-90 and try this. Change line 61 to

```
61 DIM C$(12),W(50),A$(20),J(8):FOR I=
1 TO 8:J(I)=0:NEXT I
```

and then replace lines 83-90 with the following

```
83 RESTORE 90:FOR J=1 TO 8:READ A$:POS
ITION 2,J+5:? A$:POSITION 27,J+5:? "!"
;J(J):A$="":NEXT J
90 DATA MORTGAGE REPAYMENTS,ENDOWMENT
INSURANCE,LOCAL RATES,BANK PERSONAL LO
AN,VIDEO HIRE,TV HIRE
91 DATA HIRE PURCHASE LOAN,MISCELLANEO
US
```

You will of course need to put the appropriate figures in the array J and this can be done by altering lines 102 to 110. There is an easy way to eliminate all those IF . . . THEN statements as follows

```
102 GET #4,Z:CAT=Z-64
103 ? CHR$(Z);" = !";:INPUT SUM:J(CAT)
=SUM
```

Note that 9 program lines have been reduced to two lines and only three variables are used instead of 9. Note also the introduction of more meaningful variable names which help to make the program more readable and easier to remember. Finally change line 125 to

```
125 FOR I=1 TO 8:M=M+J(I):NEXT I
```

Note that there is no error checking in the program so that if you press the wrong key you will get an error

By using an array like this, it is very easy to add further categories simply by increasing the size of the array.

There you have a few possible changes, but there are many more that could be made. I hope though that these few examples have given you just a bit more insight into programming. ●

Colour Selector

Les Ellingham

One of the simplest ways to achieve a professional polish to your programs is to use colour effectively. Even the simplest of programs in Graphics 1 or 2 can be made to look special by carefully choosing the colours of the text. Remember, in these modes you can have five colours including background on the screen without resorting to fancy tricks—just use upper and lower case and inverse.

Various books and manuals have charts of SETCOLOR values and some even have printed colour charts, but no printed page can convey the full range of Atari's 256 colours, particularly as the colours can look different depending on the background and will vary from television to television. The usual way to achieve the right balance is to experiment and change colours one by one until the desired result is obtained. As this can be a long process, I decided to write a short Utility which would take away the guesswork and show colours in close relation to each other as well as providing all the important SETCOLOR and POKE values. The result is Colour Selector.

The utility itself is very easy to use, just choose a Setcolor statement by pressing keys 0-4 and a marker will indicate which statement you will be changing. Press the right and left arrow keys to cycle up and down through the colours available. To change to another register, press SELECT and choose again. When you have achieved the balance you require, note down the SETCOLOR or POKE values to use in your own programs.

The program, although relatively simple, is interesting in that it introduces both the concepts of custom display lists and display list interrupts. Lines 1000-1050 set up a display list which comprises three lines of Graphics 0 followed by two blank lines, four lines of Graphics 1, two blank lines, four lines of Graphics 2, two blank lines, one line of Graphics 0 followed by two more blank lines, five lines of Graphics 0, two blank lines and finally two lines of Graphics 0. This may sound quite complicated but all the information to build this display list is in line 1030 and the whole display list routine only takes five program lines. The introduction of blank lines in the display gives a very pleasing effect and also helps to balance out the display list to the required 192 scan lines and assists in overcoming a small problem in the display list interrupt which does not always give a clean separation of colours when the keyboard is in use.

Now, display lists are one thing but Display List Interrupts are an entirely different proposition. Altering the display list itself is easily accomplished from Basic but Interrupts require the use of machine language and my understanding of machine language is about as deep as the average man's knowledge of nuclear physics! What I required was a way to keep the bottom half of the screen the same colour irrespective of what was being done to the registers which would normally control the background and text. Without this there would be problems in reading the information when the colours were changed. I remembered a routine in De Re Atari which does just this and duly typed it in. There was just one small problem, *the routine on page 5-3 of De Re Atari does not work!* Experimentation, they say, is the secret of learning programming techniques and after a few hours I had some small understanding of the routine, despite starting from absolute scratch. I can now proudly present in lines 1110-1130, a corrected version of a routine from De Re Atari!

To enable display list interrupts you must add 128 to the line before the one you wish to change, which is why in line 1030 a 135 follows the three 7's. Try changing this back to 7 and adding 128 to another number and see what happens. I won't explain the machine language routine (I can't!) but if you want to change the colour of the bottom half of the screen, just change the figure 18 in line 1120 to change the background and the figure 14 to change the text. The numbers to use are the same as you would use to POKE a colour register.

That's it then—Colour Selector—a simple utility which ended up teaching me quite a lot about display lists. Don't be afraid to experiment, you may surprise yourself. I would never have dreamed of presenting a correction to De Re Atari. What next? ▶

```
1 REM ******************************
2 REM *      COLOUR SELECTOR        *
3 REM *            by               *
4 REM *       Les Ellingham         *
5 REM *  First published in PAGE 6  *
6 REM *        August 1983          *
7 REM ******************************
8 REM
10 OPEN #1,4,0,"K:":COLR=14
20 GOSUB 1000:POKE 752,1
30 FOR SETCOLR=0 TO 4:COLR=PEEK(708+SE
TCOLR):GOSUB 500:NEXT SETCOLR
40 GOSUB 600
99 REM *MAIN LOOP FOR COLOUR CHANGE *
100 IF PEEK(53279)=5 THEN GOSUB 600
110 IF PEEK(764)<>6 AND PEEK(764)<>7 T
HEN 100
120 IF PEEK(764)=7 AND PEEK(753)=3 THE
N COLR=COLR+1:IF COLR>255 THEN COLR=25
5
130 IF PEEK(764)=6 AND PEEK(753)=3 THE
N COLR=COLR-1:IF COLR<0 THEN COLR=0
140 POKE 708+SETCOLR,COLR
150 GOSUB 500
160 POKE 764,255:GOTO 100
499 REM *   SUBROUTINE TO UPDATE   *
        * SETCOLOR AND POKE VALUES *
500 H=INT(COLR/16):L=COLR-H*16:P=COLR
510 ON SETCOLR+1 GOTO 520,530,540,550,
560
520 POSITION 5,9:? "SETCOLOR 0,";H;","
;L;"   ":POSITION 24,9:? "POKE 708,";P
;"  ":GOTO 570
530 POSITION 5,10:? "SETCOLOR 1,";H;",
";L;"   ":POSITION 24,10:? "POKE 709,"
;P;"  ":GOTO 570
540 POSITION 5,11:? "SETCOLOR 2,";H;",
";L;"   ":POSITION 24,11:? "POKE 710,"
;P;"  ":GOTO 570
550 POSITION 5,12:? "SETCOLOR 3,";H;",
";L;"   ":POSITION 24,12:? "POKE 711,"
;P;"  ":GOTO 570
560 POSITION 5,13:? "SETCOLOR 4,";H;",
";L;"   ":POSITION 24,13:? "POKE 712,"
;P;"  ":GOTO 570
570 RETURN
599 REM * SELECT NEXT SETCOLOR *
600 FOR DEL=9 TO 13:POSITION 3,DEL:? "
  ":NEXT DEL
610 POSITION 5,14:? "    WHICH SETCOLO
R (0-4)?      ";
615 POSITION 5,15:? CHR$(156)
620 POKE 764,255:GET #1,KEY:IF KEY<48
OR KEY>52 THEN 620
625 KEY=KEY-48:SETCOLR=KEY
630 COLR=PEEK(708+SETCOLR)
635 POSITION 3,9+SETCOLR:? "->":REM ->
 IN INVERSE
640 FOR D=1 TO 100:NEXT D
645 POSITION 5,14:? "PRESS SELECT TO C
HOOSE SETCOLOR":REM SELECT IN INVERSE
650 POSITION 5,15:? "PRESS ";CHR$(27);
CHR$(158);" OR ";CHR$(27);CHR$(159);"
TO CHANGE COLOUR"
660 RETURN
999 REM * ALTER DISPLAY LIST *
1000 GRAPHICS 0:POKE 559,0
1010 DL=PEEK(560)+256*PEEK(561)
1020 FOR I=6 TO 28:READ A:POKE DL+I,A:
NEXT I
1030 DATA 2,2,2,16,6,6,6,6,7,7,7,135,1
6,2,16,2,2,2,2,2,16,2,2
1040 POKE DL+29,65
1050 POKE DL+30,PEEK(560):POKE DL+31,P
EEK(561)
1099 REM *     LOAD DISPLAY LIST      *
         *     INTERRUPT  ROUTINE     *
1110 FOR I=1536 TO 1555:READ A:POKE I,
A:NEXT I
1120 DATA 72,138,72,169,18,162,14,141,
10,212,141,24,208,142,23,208,104,170,1
04,64
1130 POKE 512,0:POKE 513,6:POKE 54286,
192
1199 REM * PUT UP DISPLAY CHARACTERS -
NOTE UNDERLINED LETTERS IN INVERSE *
1200 POSITION 12,0:? "COLOUR  SELECTOR
"
1210 POSITION 2,2:? "AAAAAA  aaaaaa
 AAAAAA   aaaaaa"
1220 ? "AAAAAA  aaaaaa   AAAAAA   aa
aaaa"
1230 POSITION 1,4:? "
  AAA aaa  AAA  aaa"
1240 POSITION 1,5:? "AAA aaa  AAA  aaa
"
1250 POSITION 1,6:? "
  AAA aaa  AAA  aaa"
1260 POSITION 1,7:? "AAA aaa  AAA  aaa
"
1270 POSITION 3,8:? "CAPS   l/case  I
NV CAPS  inv l/case"
1280 POKE 559,34:RETURN
```

Line Lister

L. A. Lawson, Suffolk

This short addition to any program will enable the user to check for typing errors and to correct any errors found.

After you have typed in your program listing, add the following lines:

```
32500 FOR I=0 TO 5000
32510 ? CHR$(125):LIST I
32520 IF PEEK(84)=2 THEN NEXT I
32530 POKE 764,255
32540 IF PEEK(764)=255 THEN 32540
32550 NEXT I
```

The 9999 in line 32500 should be replaced with the highest line number of the program you wish to be checked. Start off by typing GOTO 32500 and the first line of your program will be displayed on an otherwise clear screen. For each subsequent line, just hit the space bar.

If a typing error is found, hit the 'BREAK' key and make the correction in the usual way. To resume checking, type I=xxxx, where xxxx is the number of the line just corrected.

Remember to delete lines 32500 to 32550 before saving your program to tape or disk. ●

A SHORT ONE

```
10 GRAPHICS 23
15 FOR X=1 TO 47:FOR Y=1 TO 47
18 COLOR RND(0)*5
30 PLOT 80+X,48+Y:PLOT 80+Y,48+X:PLOT
80+X,48-Y:PLOT 80+Y,48-X:PLOT 80-X,48+
Y:PLOT 80-Y,48+X:PLOT 80-X,48+Y
35 PLOT 80-Y,48-X:PLOT 80-X,48-Y
36 NEXT Y:NEXT X
40 GOTO 15
```

This page is put aside each issue for the exclusive use of Birmingham User Group

Bug Club Call

BEGINNERS BASIC COURSES

Mike Aston's Basic Course will be starting again around about the second meeting in September and if you did not attend the previous course make sure that you get along to this one if you want to make a start on writing your own programs. The course is aimed at the absolute novice so don't stay away thinking you are not clever enough. There will be something like seven talks altogether beginning with an understanding of the Basic commands and building up to more complex applications. If you have a little knowledge of Basic, why not sit in on the later talks?

FUTURE TALKS

If you have a reasonable knowledge about a particular subject and perhaps can write a few demonstration programs why not consider giving a talk at a future meeting? It may seem daunting but remember that many of the Club members would like to see and hear practical demonstrations of many of the things they read in the magazines. Perhaps Display Lists, Player-Missiles, Game Design, Sound Effects are your forte? Whatever, other Club members would like to hear from you. Please have a word with Mike Aston at the next meeting to organise a little talk. We seem to have run a little short of ideas over the summer. YOU can help.

MODEMS

Does any member have a Modem? We would be interested in discussing future projects involving communication and again please see Mike Aston in the first instance if you are interested. There are several GPO engineers in the membership who could no doubt give some good technical advice. How about it?

SOFTWARE LIBRARY

This report from Steve Gould:

Having now dropped my position as Treasurer, I can devote all my attention to the Software Library and second-hand software board.

I must say that both of these have been very successful, more so than I imagined. We now have approx. 80 items in the Library with new programs/books arriving every meeting. Latest additions include Zaxxon, Defender and Miner 2049er which have all been graciously donated by members as their 'membership fee' of the Library or purchased from funds generated at the meetings. All programs are only purchased for the scheme as unwanted software from members as we do not wish to offend retailers who provide members with generous discounts.

For the benefit of any Club members who are not members of the Library, the rules are quite simple. A Club member may join the Library by donating a program or paying a once only fee of £5.00. Thereafter, cassettes or disks can be hired for £1.50 per 2 week period with a maximum loan of 1 month. ROMs are £2.00 for 2 weeks and books 50p. If you have not joined why not do so, but remember you must be a Club Member.

The second-hand software board is working very well and most programs don't stay 'pinned up' for long. Such bargains as Star Raiders for £10.00 and Jumbo Jet Pilot for £15.00 have been seen in recent weeks. We don't charge for this scheme, it's simply another service for members.

As far as the Software Library is concerned there is enthusiasm amongst the members, it just needs the right spark to light the fire.

Signing off for now—see you all at the next meeting.

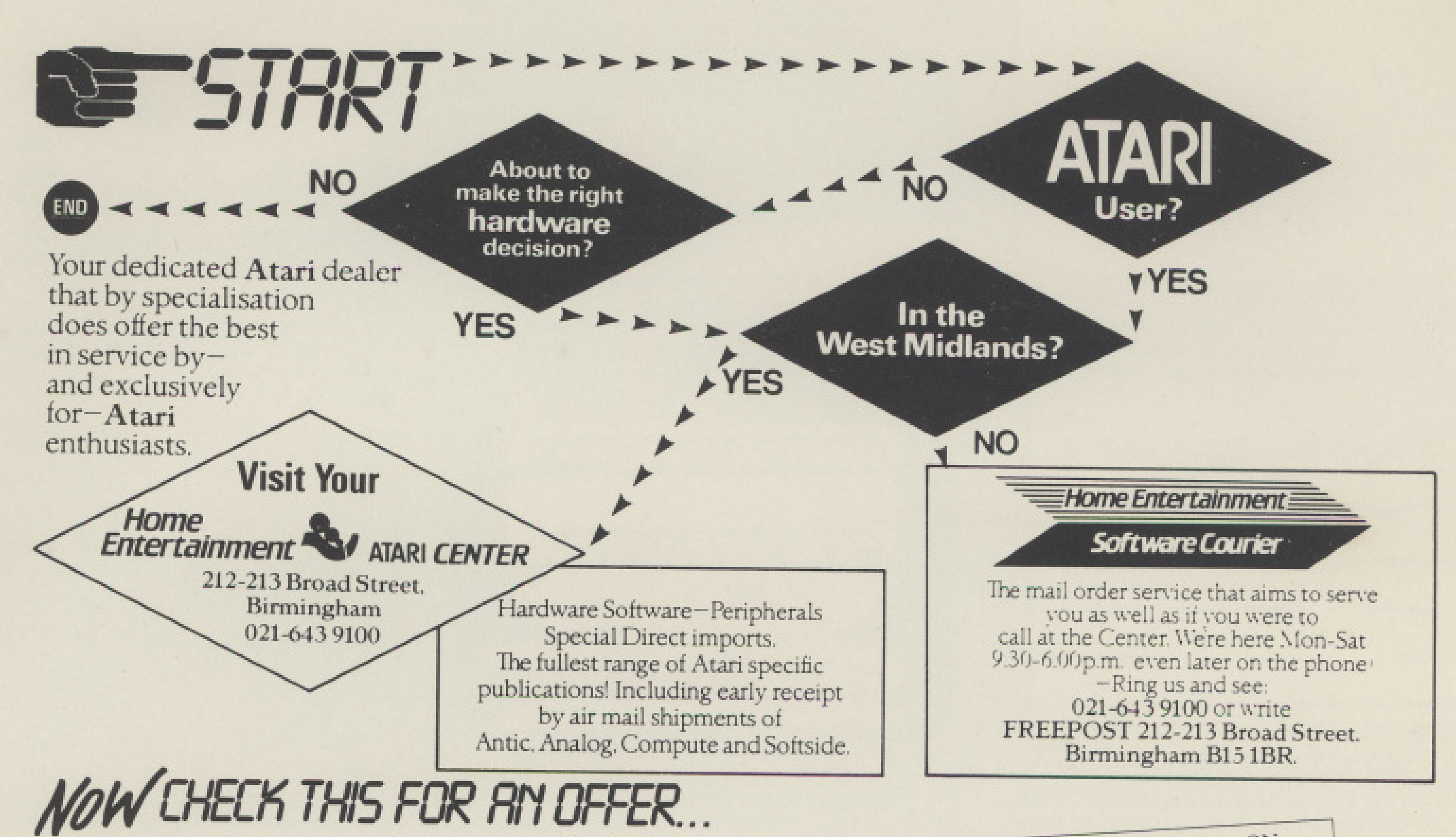
Steve Gould.

PLEASE NOTE THAT AT PRESENT THE LIBRARY FACILITIES ARE ONLY AVAILABLE TO MEMBERS WHO ATTEND CLUB MEETINGS.

TECHNICAL LIBRARY

The Club has almost all of the technical reference books for the Atari which are available for members' consultation. Please see Colin Boswell who can also supply you with disks at a very reasonable cost.

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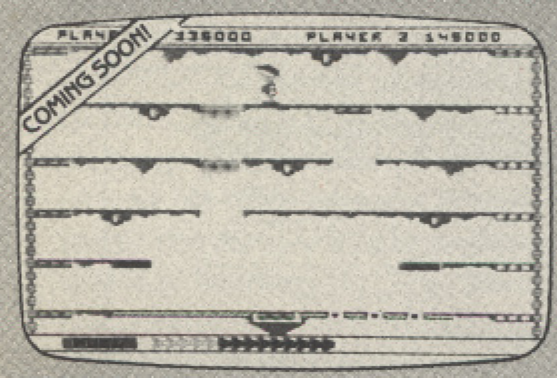
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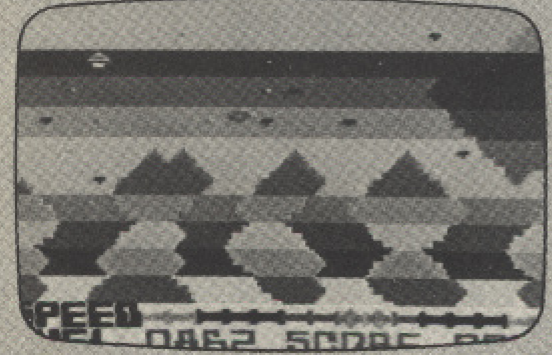
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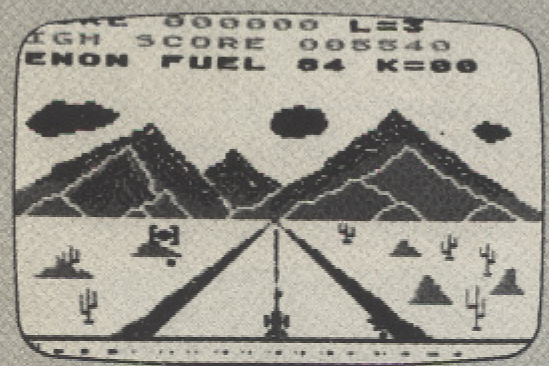
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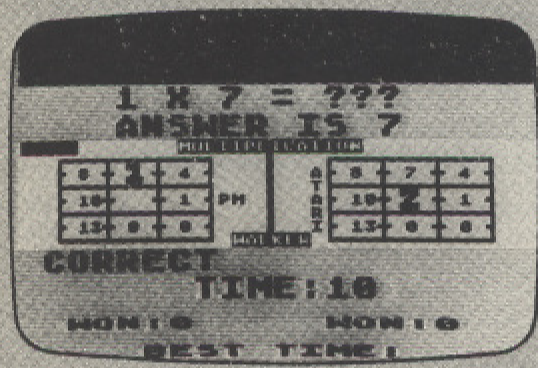
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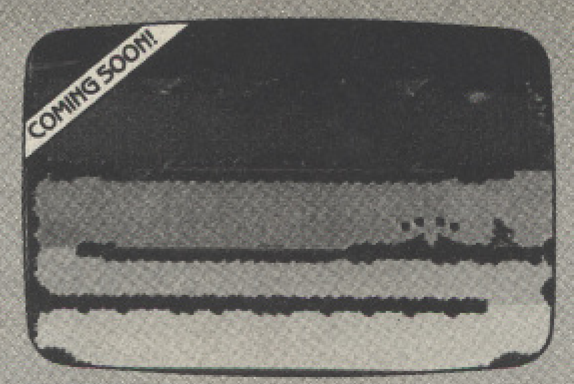


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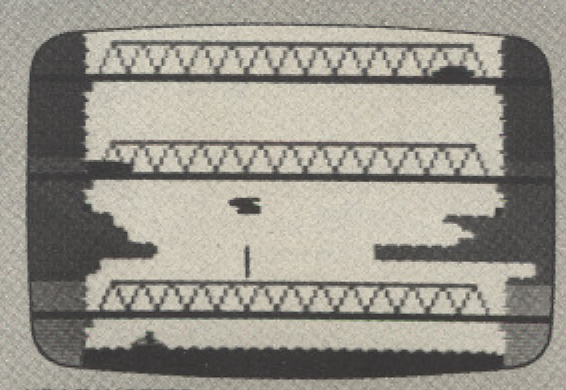


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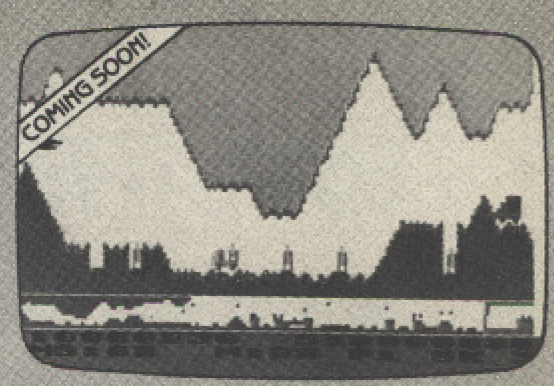
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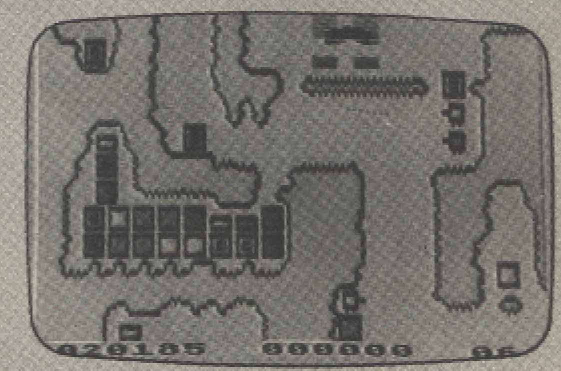
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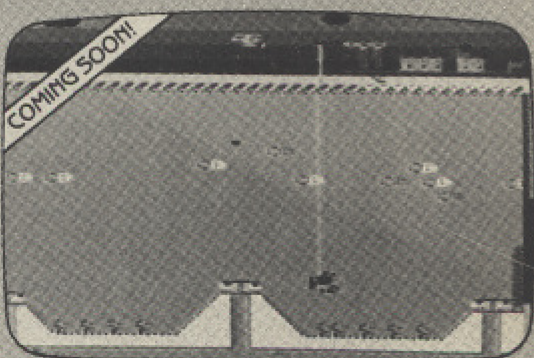
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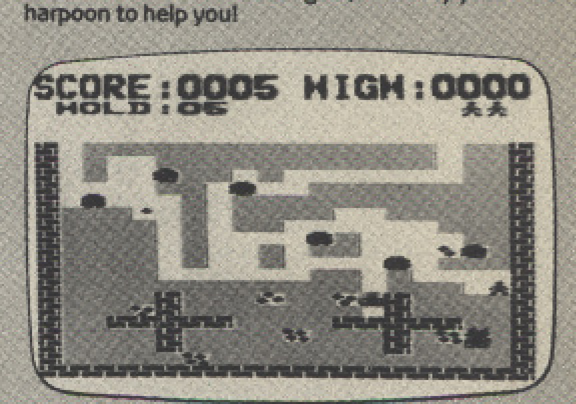
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